
**THE SEPARATION OF (ECONOMIC) POWER: A CULTURAL
ENVIRONMENTAL PERSPECTIVE OF SOCIAL PRODUCTION
AND THE NETWORKED PUBLIC SPHERE**

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I. Introduction

In 1481, the Duke of Milan issued a copyright.¹ During the fifteenth century, the first enclosure movement in the United Kingdom intensified.² In the seventeenth century, Hobbes and Locke wrote about the nature of property.³ In 1709, the Statute of Anne was enacted.⁴ In 1748, Montesquieu espoused the

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1. See RAY AUGUST, INTERNATIONAL BUSINESS LAW: TEXT, CASES AND READINGS 469 (3d ed. 2000) [hereinafter AUGUST].

2. See JAMES YELLING, COMMON FIELD AND ENCLOSURE IN ENGLAND 1450-1850 7-95 (1977) [hereinafter YELLING] (noting an important moment of the first enclosure movement).

3. See THOMAS HOBBS, LEVIATHAN 175-181 (A. R. Waller ed., Cambridge University Press 1904) (1651) (proffering that property rights are derived from the sovereign); JOHN LOCKE, THE SECOND TREATISE OF GOVERNMENT (1690), reprinted in 2 THE WORKS OF JOHN LOCKE 174-81 (Desmaizeaux, 5th ed. 1823) (opining that providing labor land gives that person rights to the property).

4. See The Copyright Act 1709, 8 Ann., c.19 (Eng.) (noting the codification of the first copyright law).

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separation of powers doctrine.⁵ In 1793, Ben Franklin pronounced patents immoral.⁶ In 1813, Thomas Jefferson sent a letter concerning patents to Isaac McPherson.⁷ In 1840, Proudhon declared that “property is theft”.⁸ In 1841, Lord Macaulay made a speech about copyright to British Parliament.⁹ Between 1888 and 1893, the State of New Jersey enacted legislation that allowed for inter-corporate ownership.¹⁰ In 1897, the UK case of *Salomon v Salomon & Co Ltd* [1897] clarified the legal traits of a corporation, namely limited liability and separate legal entity.¹¹ In 1949, Aldo Leopold published *A Sand Country Almanac*.¹² In 1962, Rachel Carson published *The Silent Spring*.¹³ In the same year Buchanan and Tullock published *The Calculus of*

5. See CHARLES MONTESQUIEU, *THE SPIRIT OF LAWS* (1748), reprinted in 38 GREAT BOOKS OF THE WESTERN WORLD 76-77 (Robert Maynard Hutchins ed., Thomas Nugent trans. 1955) [hereinafter MONTESQUIEU] (setting forth theory of separation of powers which was widely adopted).

6. See BENJAMIN FRANKLIN, *THE AUTOBIOGRAPHY OF BENJAMIN FRANKLIN* 215-16 (Frank Woodworth Pine ed., Garden City Publishing Co. 1916) (1771) (criticizing need for patents as restricting knowledge and advantages of sharing ideas).

7. See Letter from Thomas Jefferson to Isaac McPherson (Sept. 18, 1813), in *THE WRITING OF THOMAS JEFFERSON* 379-381 (Thomas Jefferson Mem'l Ass'n of the U.S. 1903) (outlining the dangers of expansive use of patents as restricting free use of everyday items).

8. See PIERRE-JOSEPH PROUDHON, *WHAT IS PROPERTY? AN INQUIRY INTO THE PRINCIPLE OF RIGHT AND OF GOVERNMENT* 11-12 (Benj. R. Tucker trans., Dover Publications, Inc. 1970) (1840) (hypothesizing that the concept of private property robs the public of access).

9. See LORD MACAULAY, *SPEECHES: THE COMPLETE WRITINGS OF LORD MACAULAY* 270-290 (Lady Trevelyan ed., Kessinger Publishing 2004) (1866) (opposing a bill extending copyright protections 60 years after the death of the author as unnecessary).

10. See, e.g., Aidan Ricketts, *LLM Thesis (Queensland University of Technology): Stretching the Metaphor: The Political Rights of the Corporate 'Person': A Critique of the Extension of Political Rights to Business Corporations* at 35 (2001); A CRITIQUE OF THE EXTENSION OF POLITICAL RIGHTS TO BUSINESS CORPORATIONS 35 (2001); *Louis K. Liggett Co. v. Lee*, 288 U.S. 517, 556 n.32 (1933) (Brandeis, J., dissenting) (noting initial New Jersey legislation regarding intercorporate stockholding).

11. See *Salomon v. Salomon & Co. Ltd.*, [1897] A.C. 22 (H.L.) 29-47 (appeal taken from Eng.) (holding that corporations are distinct entities from their owners and entitled to limited liability).

12. See ALDO LEOPOLD, *A SAND COUNTY ALMANAC* 237-64 (1966) (advocating ethical duty of people towards the land they inhabit).

13. See RACHEL CARSON, *SILENT SPRING* 5-13 (1962) (advocating for stricter environmental controls to protect nature).

Consent.¹⁴ In 1980, the US case of *Diamond v Chakrabarty* espoused the view that statutory intellectual property right subject matter is to “include anything under the sun that is made by man”.¹⁵ In 1984, Richard Stallman launched the GNU project.¹⁶ In 1995, the World Trade Organization Trade Related Intellectual Property Agreement came into force.¹⁷ In 1997, James Boyle coined the notion “cultural environmentalism”.¹⁸ In 2002, Lawrence Lessig published *The Future of Ideas*.¹⁹ In 2006 Yochai Benkler published *The Wealth of Networks*.²⁰ In 2009, I began writing this article.²¹

Amongst these seemingly miscellaneous and disparate events lie several common threads. There is, for instance, a direct correlation between the rise of corporate power and the strength of the international Intellectual Property Rights (IPRs) regime.²² Likewise, there is a parallel between the contemporary

14. See JAMES BUCHANAN & GORDON TULLOCK, *THE CALCULUS OF CONSENT: LOGICAL FOUNDATION OF CONSTITUTIONAL DEMOCRACY* 3-11 (1962) [hereinafter BUCHANAN, *CALCULUS OF CONSENT*] (outlining the principles of the public choice theory in economics and political science).

15. *Diamond v. Chakrabarty*, 447 U.S. 303 (1980) (citing S. Rep. No. 82-1979, at 4 (1952)) (illustrating broad scope of items subject to patent statutes).

16. See RICHARD M. STALLMAN, *FREE SOFTWARE, FREE SOCIETY: SELECTED ESSAYS OF RICHARD M. STALLMAN* 20 (Joshua Gay ed., 2002) (creating freedom software collaboration project for sharing software).

17. See Marrakesh Agreement Establishing the World Trade Organization, Apr. 15, 1994, 1867 U.N.T.S. 154, archived at <http://www.webcitation.org/5sQ1c020I> (announcing the inception of the Trade-Related Aspects of Intellectual Property Rights Agreement).

18. See James Boyle, *A Politics of Intellectual Property: Environmentalism for the Net?*, 47 DUKE L.J. 87, 108-12 (1997) [hereinafter Boyle, *A Politics of Intellectual Property*] (comparing current state of intellectual property issues to environmental movement of the mid 1900s).

19. See LAWRENCE LESSIG, *THE FUTURE OF IDEAS: THE FATE OF THE COMMONS IN A CONNECTED WORLD* 240-61 (2002) [hereinafter LESSIG] (illustrating limitation imposed by Congress on creativity and intellectual freedom on the internet).

20. See YOCHAI BENKLER, *THE WEALTH OF NETWORKS: HOW SOCIAL PRODUCTION TRANSFORMS MARKETS AND FREEDOM* 460-73 (2006) [hereinafter BENKLER] (advocating social production as supplement to traditional information mediums and discouraging government regulation).

21. See Robert Cunningham, *The Tragedy of (Ignoring) the Information Semicommons: A Cultural Environmental Perspective*, 4 AKRON INTELL. PROP. J. 1 (2010).

22. See Howard C. Anawalt, *International Intellectual Property, Progress, and the Rule of Law*, 19 SANTA CLARA COMPUTER & HIGH TECH. L.J. 383, 400 (2003) (observing corporate power can influence government, engage in

environmental movement that tackles environmental challenges in the physical world, and the newly emerging discourse of cultural environmentalism that confronts challenges in the information environment.²³

This article begins by contextualizing IPRs through a brief exploration of the second enclosure movement. The emergent discourse of cultural environmentalism is then employed so as to draw upon the analytical framework of public choice theory, which in turn is explored so as to contextualize social production and the networked public sphere. Through an exposition of the comparative advantages of social production when pitted against alternate modes of production, the paper highlights the significant role that social production may serve in separating economic power. That is, just as Montesquieu espoused the need to separate *political* power in the eighteenth century, so too this article espouses the need to separate *economic* power in the twenty-first century.²⁴ While formal legal constitutional mechanisms are unlikely to wield this requisite separation of economic power, it may be that social production has an important practical role in delivering this outcome. Contemporaneously, in the absence of the requisite political will, the separation of economic power will only eventuate through adherence to the laws of economics. It is within this context that the paper explores the comparative advantage of social production when pitted against state-, firm-, and market- based production by contrasting computer software development with other form of technological innovation, namely biotechnology and nanotechnology.

To be sure, social production will not always supplant the state, the market, or the firm, as the preferred mode of production. Rather, the thesis of this article is more nuanced:

international negotiation and expense patent litigation).

23. See Boyle, *A Politics of Intellectual Property*, *supra* note 18, at 108-12 (explaining that both movements perceived a common interest to build effective political coalitions).

24. See MONTESQUIEU, *supra* note 5, at 76-77 (stressing the need for checks and balances to control government).

where the factors of production include undeveloped ideas and unarticulated know-how, and where the allocation of human creativity and/or intellectual input are relied upon as the engines of innovation, social production may in some instances surpass the advantages of state-, firm-, and market- based production. In so doing, social production potentially proffers an important practical contribution to the contemporary liberal project of separating (economic) power.

II. The Second Enclosure Movement

In the fifteenth century, the structure of land ownership in England began a rapid transformation.²⁵ Drawing upon a variety of methods, the aristocracy appropriated for private ownership land that had been traditionally held in common.²⁶ This was referred to as the “enclosure movement,” whereby the *right to exclude* was utilized to convert the default form of land tenure from commons property to private property.²⁷ Enclosure has continued up until this day, albeit contemporary *limited-commons* and *semicommons* analysis suggests a more complex picture.²⁸

Boyle’s depiction of real property rights within the

25. See Dan Hunter, *Cyberspace as Place and the Tragedy of the Digital Anticommons*, 91 CALIF. L. REV. 439, 500 (2002) [hereinafter Hunter] (detailing historical shift in land ownership).

26. See YELLING, *supra* note 2, at 7-95 (outlining different methods used toward this end).

27. See Hunter, *supra*, note 25, at 500 (defining enclosure movement and its effects); see *Kaiser Aetna v. U.S.*, 444 U.S. 164, 176 (1979) (characterizing “the right to exclude others” as “one of the most essential sticks in the bundle of rights that are commons characterized as property”).

28. See ELINOR OSTROM, *GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION* 61 n.3.1 (1990) (noting the continuation of enclosure and its implementation in American land policy); ROBERT C. ELLICKSON, CAROL M. ROSE & BRUCE A. ACKERMAN, *PERSPECTIVES ON PROPERTY LAW*, at xviii (3rd ed. 1995) (citing a shared dormitory room as common property); Robert Ellickson, *Property in Land*, 102 YALE L.J. 1315, 1394-95 (1993) (noting that the majority of Americans live in limited-commons property environments within multiperson households); Henry E. Smith, *Semicommon Property Rights and Scattering in the Open Fields*, 29 J. LEGAL STUD. 131, 160 (2000) (drawing attention to the fact that open fields and enclosed fields coexisted for centuries).

context of the first enclosure movement examines social contract questions regarding the legitimacy of state power and the incentivisation that is *seemingly* inherent within those rights.²⁹ Seemingly, as empirical evidence does not always support a direct correlation between property rights and increasing production.³⁰ The classic “tragedy of the commons” does not always eventuate in practice.³¹

Property rights concerning both *real* property and *intellectual* property remain at center stage in contemporary theoretical discussion relating to economic efficiency and justice.³² Property definitions and descriptions abound from Hobbes to Locke to Blackstone to Hume to Proudhon.³³ Although the definition of property differs depending on the context, at its

29. See James Boyle, *The Second Enclosure Movement and the Construction of the Public Domain*, 66 LAW & CONTEMP. PROBS. 33, 34-35 (2003) [hereinafter Boyle, *The Second Enclosure Movement*] (depicting enclosure movement as effective despite criticisms).

30. See ROBERT C. ALLEN, ENCLOSURE AND THE YEOMAN 17-19 (1992); Robert C. Allen, *The Efficiency and Distributional Consequences of Eighteenth Century Enclosures*, 92 ECON. J. 937, 950-51 (1982) (providing empirical evidence relating to agricultural production); cf. Michael Turner, *English Open Fields and Enclosures: Retardation or Productivity Improvements*, 46 J. ECON. HIST. 669, 688 (1986) (detailing increase in unit farm output resultant from enclosure).

31. Cunningham, *supra* note 21.

32. See Jane Anderson and Kathy Bowrey, *The Imaginary Politics of Access to Knowledge: Whose Cultural Agendas are Being Advanced?*, AUSTRALASIAN INTELLECTUAL PROPERTY LAW RESOURCES (2006), archived at www.webcitation.org/5sS4TTtdy (asserting a critical, indigenous perspective).

33. See, e.g., HOBBS, *supra* note 3 (explaining that property rights are the subject of sovereign discretion, but that the sovereign is bound to offer the citizens certain protections relating to property ownership such as providing a judicial system of resolution in matters concerning property conflict); JOHN STUART MILL, ON LIBERTY (David Bromwich & George Kateb eds., Yale University Press 2003) (1859) (casting property within the social contract context whereby freedom is traded in for certain securities stemming from impartial sovereign protection of property); 2 WILLIAM BLACKSTONE, COMMENTARIES ON THE LAWS OF ENGLAND 2 (The University of Chicago Press 1979) (1766) (defining property as the “sole and despotic dominion which one man claims and exercises over the external things of the world, in total exclusion of the right of any other individual in the universe”); DAVID HUME, MORAL PHILOSOPHY 87-92 (Sayre-McCord ed., Hackett Publ’g Co. 2006) (1744) (advocating pragmatic, but unnatural, view whereby property ownership is adopted as means of dividing limited resources); PROUDHON, *supra* note 8, at 43-44 (making important distinction between possession and property).

simplest Benkler describes property as a “cluster of background rules that determine what resources each of us has when we come into relations with others, and, no less important, what ‘having’ or ‘lacking’ a resource entails in our relations with these others.”³⁴

From the early days of IPRs, critics have voiced concerns about the broad-ranging nature of the said rights. The philosophical beliefs of the founding generation in the United States were heavily influenced by the Scottish Enlightenment and the traditional struggle of the people against the ruling class.³⁵ They were not against IPRs *per se*, but they repeatedly referred to the necessity to restrict both its term and its scope so as to avoid low quality, high prices and artificial scarcity.³⁶ Specifically, they questioned whether individuals should have exclusive intellectual property rights in light of the fact that innovation occurs cumulatively.³⁷ Furthermore, they were concerned, as are many contemporary scholars, that IPRs would grant an individual unwarranted power over important aspects of society and technology which may in turn affect the future of innovation.³⁸ The overarching theme, however, was the fear that monopolies would interfere with free trade.³⁹ Nineteenth century musings such as Thomas Jefferson’s letter to Isaac McPherson and Lord Macaulay’s speeches within the British Parliament, oft quoted within the digerati, reflect these general sentiments.⁴⁰

34. BENKLER, *supra* note 20, at 143-44 (discussing the background rules of property law).

35. Boyle, *The Second Enclosure Movement*, *supra* note 29, at 57; JAMES BOYLE, *THE PUBLIC DOMAIN: ENCLOSING THE COMMONS OF THE MIND*, 36-37 (2008) [hereinafter BOYLE, *THE PUBLIC DOMAIN*].

36. See BOYLE, *THE PUBLIC DOMAIN*, *supra* note 35, at 37 (discussing the concerns of the early critics).

37. BOYLE, *THE PUBLIC DOMAIN*, *supra* note 35, at 37; see FRANKLIN, *supra* note 6, at 215 (relating Franklin’s views against IPRs to encourage further innovation).

38. BOYLE, *THE PUBLIC DOMAIN*, *supra* note 35, at 37.

39. *Id.*

40. See Boyle, *The Second Enclosure Movement*, *supra* note 29, at 53-57 (outlining concerns espoused by both Thomas Jefferson and Lord Macaulay over IPR protection); LESSIG, *supra* note 19, at 207 n.78 (quoting a Letter from Thomas Jefferson to James Madison (July 31, 1788), in 13 *THE PAPERS OF THOMAS JEFFERSON*, 442-443 (Julian Boyd ed., Princeton Univ. Press 1956). Note

In the contemporary context, the nineteenth century criticisms relating to monopolies and the centralization of power stemming from IPRs have manifested in the second enclosure movement critique.⁴¹ This critique encompasses the theme that information, knowledge, and culture have become increasingly privatized through the intellectual property system so as to secure the economic returns demanded by the manufacturers of the industrial information economy.⁴² As Benkler states:

The economic returns to exclusive proprietary rights in information are highly concentrated in the hands of those who own such rights... Monopoly is a good thing to have if you can get it. Its value for rent extraction is no less valuable for a database or patent—based company than it is for the dictator’s nephew in a banana republic.⁴³

that criticism of IPRs was certainly not confined to the UK or the USA during the nineteenth century. See Fritz Machlup & Edith Penrose, *The Patent Controversy in the Nineteenth Century*, 10 J. ECON. HIST. 1, 1 (describing historical opposition to patent system during nineteenth century). The Congress of German Economists, for instance, resolved in 1863 that “patents hinder rather than further the progress of invention,” and the Netherlands abolished their patent system in 1869 as a corollary of the same criticisms. Boyle, *The Second Enclosure Movement*, *supra* note 29, at 56-57 quoting Fritz Machlup and Edith Penrose, *The Patent Controversy in the Nineteenth Century*, 10 J. ECON. HIST. 1, 4-5 (noting anti-patent movements in Germany and Holland). Indeed in the said countries “various proposals were made to replace patent, with state-provided prizes or bounties to particularly useful inventions being the most popular.” Boyle, *The Second Enclosure Movement*, *supra* note 29, at 57.

41. See Boyle, *The Second Enclosure Movement*, *supra* note 29, at 37-38 (discussing whether private property rights are essential to research); James Boyle, *Cruel, Mean, or Lavish? Economic Analysis, Price Discrimination and Digital Intellectual Property*, 53 VAND. L. REV 2007, 2010-14 (2000) [hereinafter Boyle, *Cruel, Mean or Lavish*] (questioning whether the monopolies created by the expansion of IPRs are justified); see also Peter Drahos, *A Defence of the Intellectual Commons*, 16 CONSUMER POL’Y REV. 101, 101 (2006) (arguing that monopoly rights within intellectual property rights are dangerous).

42. See Boyle, *The Second Enclosure Movement*, *supra* note 29, at 57-58 (questioning the benefit of eliminating monopolies); Peter K. Yu, *Intellectual Property and the Information Ecosystem*, 2005 MICH. ST. L. REV. 1, 11-12 (2005) (contrasting the pros and cons of privatizing intellectual property).

43. BENKLER, *supra* note 20, at 319 (arguing that strong property rights aid the wealthy and that they led to increasing exclusive rights).

Within the academy, the second enclosure critique is exemplified by Lange's thought-provoking examination of the public domain; Samuelson's perceptive account of the application of copyright to computer programs and digital materials; and Litman's work on digital copyright and the public domain.⁴⁴ Boyle has enriched this theoretical landscape through his exploration of the basic romantic assumptions underlying intellectual property constructs; his description of the second enclosure movement; and, perhaps most importantly within the context of this paper, his visionary plea to adopt an environmentalist framework so as to preserve the public domain.⁴⁵

In diagnosing the harmful effects of the present enclosure movement Boyle, Lessig, Benkler (among others) have turned to empirical evidence, or the lack thereof, concerning the benefits and detriments of IPRs.⁴⁶ Traditionally, theorists have

44. See JESSICA LITMAN, DIGITAL COPYRIGHT (2nd ed. 2006); David Lange, *Recognizing the Public Domain*, 44 LAW & CONTEMP. PROBS. 147, 158-64 (1982) (illustrating that the value of intellectual property derives from government protection at the cost of public domain interests); Jessica Litman, *The Public Domain*, 39 EMORY L. J. 965, 1010-11 (1990) [hereinafter Litman, *The Public Domain*] (observing a narrow distinction between plagiarism and original work, which requires a presumption of originality); Pamela Samuelson, Randall Davis, Mitchell D. Kapor & J.H. Reichman, *A Manifesto Concerning the Legal Protection of Computer Programs*, 94 COLUM. L. REV. 2308, 2332-63 (1994) (setting forth the current state and the challenges of obtaining a copyright for intellectual property).

45. See JAMES BOYLE, SHAMANS, SOFTWARE AND SPLEENS: LAW AND THE CONSTRUCTION OF THE INFORMATION SOCIETY 139-40 (1996) [hereinafter BOYLE, SHAMANS, SOFTWARE AND SPLEENS] (noting that the current system rests on assumption and faith rather than evidence); Boyle, *A Politics of Intellectual Property*, *supra* note 18, at 108-16 (analogizing what a political structure within intellectual property would be like to that of the American environmental movement); Boyle, *The Second Enclosure Movement*, *supra* note 29, at 37-40 (detailing the second enclosure's expansion of protected areas of intellectual property). See also BENKLER, *supra* note 20, at 91-132 (discussing the role of social production in transforming markets and freedom). *But cf.* LESSIG, *supra* note 19, at 120-21 (recognizing the barriers existing within the second enclosure movement which limit technological creativity).

46. See, e.g., BENKLER, *supra* note 20, at 38 (observing that there is a lack of empirical evidence supporting that stronger copyright and patent laws result in efficiency); Boyle, *Cruel, Mean or Lavish*, *supra* note 41, at 2016-17 (observing that lack of empirical evidence hurts the argument favoring intellectual property); Litman, *The Public Domain*, *supra* note 44, at 998 (contending that empirical evidence is uncollectable).

acknowledged both economic and moral justifications for IPRs.⁴⁷ That is, economically society is obliged to reward persons to the extent that they have produced something useful in accordance with the dictum “as one sows, so should one reap;” and morally, it is said that, at least within the context of liberal philosophy, that a person has a natural right to the product of her brain.⁴⁸ With respect to patents, the theory states, if an inventor cannot get a patent then she will have less incentive to invent because others will be able to benefit from her invention without the cost of creating it.⁴⁹ This is the classic provisioning problem that stems from (so-called) free riding.⁵⁰ As the theory goes, if people can free ride there are fewer inventors and, as a consequence, less progress in “science and useful arts.”⁵¹

While the *theory* of incentivisation and IPRs is compelling, most of the evidence that supports IPRs is indeed *theoretical* rather than *empirical* in nature.⁵² It is true that, in theory at least,

47. See, e.g., SUBCOMM. ON PATENTS, TRADEMARKS, AND COPYRIGHTS, OF THE S. COMM. ON THE JUDICIARY, 85th Cong., An Econ. Review of the Patent Sys., at 21 (Comm. Print 1958) (prepared by Fritz Machlup) (explaining the “reward-by-monopoly” thesis which addresses the moral justifications of IPRs as well as the “monopoly-profit-incentive” thesis which addresses the economic justifications of IPRs); Stephen Breyer, *The Uneasy Case for Copyright: A Study of Copyright in Books, Photocopies and Computer Programs*, 84 HARV. L. REV. 281, 284-321 (1970) (analyzing the two basic arguments for copyright protection: 1) a moral rights argument and 2) the economic arguments).

48. SAM RICKETSON & MEGAN RICHARDSON, *INTELLECTUAL PROPERTY: CASES, MATERIALS AND COMMENTARY* 11 (2nd ed. 1998).

49. See LESSIG, *supra* note 19, at 205 (outlining the pro-patent protection argument favoring patent protection to promote incentivization).

50. “So-called” because free-riding analysis sometimes ignores positive externalities, spillovers or network effects that are discussed in works such as LESSIG, *supra* note 19, at 205 (commenting on the effects of free-riding within the patent regime); Joseph Farrell, *Standardization and Intellectual Property*, 30 JURIMETRICS J. 35, 36-38, 45-47 (1989) (discussing network effects and externalities plus costs and benefits associated with network standardization); Brett M. Frischmann, *Cultural Environment and The Wealth of Networks*, 74 U. CHI. L. REV. 1083, 1106-07 (2007) [hereinafter Frischmann, *Cultural Environment*]; Brett M. Frischmann & Mark A. Lemley, *Spillovers*, 107 COLUM. L. REV. 257, 280-81 (2007) (indicating that “[i]nnovation is cumulative and is generally spurred by decentralized competition. This is particularly likely to be true of an innovation subject to productive reuse, since no one owner can capture the full value of that innovation anyway”); Samuelson et al., *supra* note 44, at 2375 (commenting on externalities or spillovers associated with the software industry).

51. LESSIG, *supra* note 19, at 205.

52. See Robert Hurt & Robert Schuchman, *The Economic Rationale for*

some types of innovation patents are *very likely* to induce more innovation, particularly where innovation is independent, or noncumulative, which is to say that one invention is essentially separate from another.⁵³ Moreover, even where innovation is cumulative, if the use of the patent is obvious then the original patent holder will be compelled to license a patent to follow-on innovators.⁵⁴ However, when the direction of an improvement to an invention is ambiguous, then licensing may not occur, and patents may in fact impede innovation.⁵⁵ Hence it can be reasoned that there are situations where innovation will be assisted by the provision of patents as well as situations where it will be harmed.⁵⁶ Semicommons theory provides a theoretical foundation for this reasoning.⁵⁷

Within the incentivization context, Lerner's study concerning the economics of innovation is thought provoking.⁵⁸ He considered amendments in intellectual property law in sixty countries over a time frame of one hundred and fifty years, examining nearly three hundred intellectual property policy

Copyright, 56 AM. ECON. REV. 421, 432 (1966) (concluding copyright protection was not the best rewarding method), *discussed in* BENEDICT ATKINSON, *THE TRUE HISTORY OF COPYRIGHT: THE AUSTRALIAN EXPERIENCE 1905-2005* 9 (2007). *See also* Samuel Oddi, *The International Patent System and Third World Development: Reality or Myth?*, 63 DUKE L.J. 831, 837-42 (1987) (surmising the difficulty of ascertaining a net social benefit resulting from the patent system).

53. *See* Adam Jaffe, *The U.S. Patent System in Transition: Policy Innovation and the Innovation Process* 24 (Nat'l Bureau of Econ. Research, Working Paper No. 7280, 1999) (discussing independent inventions).

54. *See* LESSIG, *supra* note 19, at 205 (discussing reasons in favor of granting patent rights).

55. *See* LESSIG, *supra* note 19, at 205 (describing economists' argument against granting patent right); *See also* THOMAS MANDEVILLE, *UNDERSTANDING NOVELTY: INFORMATION, TECHNOLOGICAL CHANGE AND THE PATENT SYSTEM* 31-32 (1996) (concluding that patents are not effective in promoting innovation).

56. *See* Samuelson et al., *supra* note 44, at 2375-76 (noting consumers demand software that operates on a variety of hardware platforms). Network externalities or spillovers provide one explicit example whereby IPRs may indeed cause harm. *See* Joseph Farrell, *Standardization and Intellectual Property*, 30 JURIMETRICS J. 35, 36-38, 45-46 (1989) (discussing network effects).

57. *See* Cunningham, *supra* note 21 (discussing semicommons theory).

58. *See* Joshua Lerner, *Patent Protection and Innovation Over 150 Years* 30-31 (Nat'l Bureau of Econ. Research, Working Paper No. 8977, 2002) (concluding that enhancing the strength of patent protection reduced the number of patent applications filed).

changes.⁵⁹ His study found that investment in research and development decreases slightly when patent law is strengthened.⁶⁰ The inference is that when a country strengthens its patent protection, it marginally reduces the level of investment in innovation by local firms.⁶¹

To be sure, empirical and theoretical skepticism concerning IPRs is not new; it has existed since the early days of the patent system. Ben Franklin pronounced patents immoral in his autobiographical account in 1793, and Mertonian norms (although subject to contestation) have lingered in science since time immemorial.⁶² Even within the contemporary context, avid supporters of the IPR system have expressed latent skepticism.⁶³

59. *See id.* at 1 (summarizing the study).

60. *See id.* at 30-31 (finding negative impact of enhanced patent protection on patent applications), *noted in* BENKLER, *supra* note 20, at 39 (describing results of Lerner's research).

61. *See* BENKLER, *supra* note 20, at 39 (clarifying implications of Lerner's conclusion). The difficulty of proving the correlation between IPRs and Research & Development is partly because of the difficulty of separating cause and effect. *See* AGRICULTURE AND THE WTO 256 (Merlinda D. Ingco & John D. Nash eds., 2004) ("IPRs may stimulate more investment, but countries and firms that invest more in R&D may demand more protection."). The experience of the US and China specifically in relation to agriculture is thought provoking. *See* ROBERT ALI BRAC DE LA PERRIERE & FRANCK SEURET, BRAVE NEW SEEDS: THE THREAT OF GM CROPS TO FARMERS 94-95 (Manisha Sovani & Vijaya Rao trans., Zed Books 2000) (noting that the Chinese are one of the most advanced rice breeders in the world even though historically they have not had any form of protection on new plant varieties). "On the other hand, in the US, protection led to an increase in improvement programs for only two plant species." *Id.*; *see also* L.J. (Bees) Butler, *Plant Breeders' Rights in the U.S.: Update of a 1983 Study*, in INTELLECTUAL PROPERTY RIGHTS AND AGRICULTURE IN DEVELOPING COUNTRIES 17, 25 (Jeroen van Wijk & Walter Jaffé eds., 1996) (concluding that PVPAs stimulated the development of new varieties of soybeans and wheat); BRAC DE LA PERRIERE & SEURET, *supra*, at 94-95 (discussing consequences of vegetal breeding). De La Perriere and Seuret write:

The rare studies that were conducted in countries where the protection of vegetal breeding has existed for decades, like the US, show that this type of legal system had several consequences: a low stimulus impact on plant improvement, reduced information and genetic material exchange between the private sector and the public sector, a reduced role of the public sector in plant improvement, and an increase in the price of seeds sold to farmers.

BRAC DE LA PERRIERE & SEURET, *supra*, at 94-95.

62. *See* FRANKLIN, *supra* note 6, at 215-16 (stating inventions should be freely enjoyed by public); Robert Merton, *A Note on Science and Democracy*, 1 J. OF LEGAL & POL. SOC. 115, 123 (1942).

63. *See* FRED WARSHOFSKY, THE PATENT WARS 143-144 (1994) (quoting software professionals' opinions about current state of IP protection).

Bill Gates, for instance, wrote the following memo to Microsoft executives in 1991, "If people had understood how patents would be granted when most of today's ideas were invented and had taken out patents, the industry would be at a complete standstill today."⁶⁴

This empirical, theoretical and pragmatic skepticism concerning IPRs has become an important pillar of "cultural environmentalism"—a notion coined by James Boyle in his seminal work *A Politics of Intellectual Property: Environmentalism for the Net?*⁶⁵

III. Cultural Environmentalism

Cultural environmentalism is an emergent field of inquiry that, *inter alia*, seeks to apply analytical frameworks of contemporary environmentalism to IPR issues.⁶⁶ It has stemmed from Boyle's submission that those who seek to protect the public domain and the intellectual commons are working toward a similar end as environmentalists.⁶⁷ Like many socio-political movements and discourses, cultural environmentalism is

64. *Id.* at 170 (quoting Bill Gates, CEO of Microsoft, providing a potential solution to patent thickets).

65. See Boyle, *A Politics of Intellectual Property*, *supra* note 18, at 108-12 (arguing that the fewer intellectual property rights there are, the greater the benefit to the public domain). Boyle compares IPR issues with issues underlying the environmental movement of the 1950s and 1960s. See *id.*

66. See Boyle, *A Politics of Intellectual Property*, *supra* note 18, at 108-12 (discussing applicability of the 1950s and 1960s environmental movement to contemporary intellectual property issues); see also James Boyle, *Cultural Environmentalism and Beyond*, 70 LAW & CONTEMP. PROBS. 5, 6-7 (2007) [hereinafter Boyle, *Cultural Environmentalism*] (defining cultural environmentalism and its current application to IPRs).

67. See Lawrence Lessig, *Foreword*, 70 LAW & CONTEMP. PROBS. 1, 1 (2007) [hereinafter Lessig, *Forward*] (analogizing the goal of environmentalists to that of those seeking to preserve the public domain). Although cultural environmentalism only entered the digerati lexicon in the past decade, the intellectual foundation of cultural environmentalism draws upon a rich tapestry of historical thought and action. See *id.* Jefferson, Franklin, Madison, and Macaulay have all proved inspirational figures within the cultural environment. See *id.* See also Boyle, *Cultural Environmentalism*, *supra* note 66, at 7-10 (2007) (drawing upon rich tapestry of historical figures within cultural environmentalism). See also AUGUST, *supra* note 1, at 453 (observing that the first copyright was enacted by the Duke of Milan in 1481, and the *Statute of Anne* was subsequently enacted in 1709).

simultaneously reactive and proactive.⁶⁸ It has “reacted” by exposing the harms caused by a relentlessly maximalist program of IPR expansion (as alluded to above).⁶⁹ It has “proacted” through the creation and maintenance of open source initiatives, creative commons projects and distributed creativity (as alluded to below).⁷⁰

Cultural environmentalism is perhaps best understood through description rather than definition. At its core, it is concerned with reconciling economics and information regulation in a manner that promotes efficiency *and* justice.⁷¹ It engages with this reconciliatory process by concerning itself with the manner in which the public domain and the commons can preserve the health and diversity of the information ecology.⁷² As Boyle states:

Right now, it seems to me that, in a number of respects, we are at the stage that the American environmental movement was at in the 1950s or 1960s. At that time, there were people—supporters of the park system, hunters, birdwatchers and so on—who cared about what we would now identify as “environmental issues”. In the world of intellectual property we now have start-up software engineers, libraries, appropriationist artists, parodists, biographers, biotech researchers, and others.⁷³

As implied, the notion of a single “environment” brings together various groups of people with a “reframed conception of common

68. See Boyle, *Cultural Environmentalism*, *supra* note 66, at 10-14 (noting division between reactive-looking maximalists and proactive minimalists).

69. See Boyle, *Cultural Environmentalism*, *supra* note 66, at 11 (highlighting harm of monopolies and pessimistic view of market performance).

70. See Boyle, *Cultural Environmentalism*, *supra* note 66, at 11-12 (observing that cheaper technological innovations expand creativity without legal limitations to access).

71. See BOYLE, SHAMANS, SOFTWARE, AND SPLEENS, *supra* note 45, at ix-xi (stressing the importance of efficiency and fairness to cultural environmentalism).

72. See BOYLE, SHAMANS, SOFTWARE, AND SPLEENS, *supra* note 45, at ix-xi (arguing that justice is not met because rights are conferred to wrong people and are undervalued).

73. Boyle, *A Politics of Intellectual Property*, *supra* note 18, at 108.

interest.”⁷⁴ This reframed conception of the common interest allows the duck-hunter and the bird-watcher to recognise their commonality in the sense that they both rely on the functioning of the wetlands and the accompanying ecosystem services.⁷⁵

Boyle explains:

The invention of the concept of “the environment” pulls together a string of otherwise disconnected issues, offers analytical insight into the blindness implicit in prior ways of thinking, and leads to perception of common interest where none was seen before. Like the environment, the public domain must be “invented” before it is saved. Like the environment, like “nature,” the public domain turns out to be a concept that is considerably more slippery than many of us realize. And, like the environment, the public domain nevertheless turns out to be useful, perhaps even necessary.⁷⁶

Boyle’s contention is that whereas the environmental movement illuminated the effects that social decisions can have upon ecology, cultural environmentalists seek to illuminate the effects that intellectual property laws can have upon culture and the information environment.⁷⁷ It is in this context that Boyle advocates for a set of analytical tools that advance the importance of the public domain:

[A] successful political movement needs a set of (popularizable) analytical tools which reveal common interests around which political coalitions can be built. Just as “the environment” literally disappeared as a concept in the analytical structure of private property claims, simplistic “cause and effect” science, and markets characterized by negative externalities, so too the “public domain” is disappearing, both conceptually and literally, in an intellectual property system built around the

74. Boyle, *The Second Enclosure Movement*, *supra* note 29, at 72.

75. See Boyle, *The Second Enclosure Movement*, *supra* note 29, at 72-73 (illustrating how divergent interests can be united for common movement).

76. Boyle, *The Second Enclosure Movement*, *supra* note 29, at 52.

77. See Boyle, *A Politics of Intellectual Property*, *supra* note 18, at 113-16 (comparing the effects of the environmental movement to the public domain).

interests of the current stakeholders and the notion of the original author. In one very real sense, the environmental movement invented the environment so that farmers, consumers, hunters and birdwatchers could all discover themselves as environmentalists. Perhaps we need to invent the public domain in order to call into being the coalition that might protect it.⁷⁸

One of the first points of call concerning *contemporary* environmentalism is *Silent Spring* published by Rachel Carson in 1962.⁷⁹ The work of Carson, coupled with the unwitting assistance of Leopold and perhaps Pigou, led to some unique insights that consequently shifted normative thought concerning societal governance decisions.⁸⁰ As Plater stated:

What we might call the Rachel Carson Paradigm declared that, although humans naturally try to maximize their own accumulation of benefits and ignore negative effects of their actions, a society that wishes to survive and prosper must identify and take comprehensive account of the real interacting consequences of individual decisions, negative as well as positive, whether the marketplace accounts for

78. Boyle, *A Politics of Intellectual Property*, *supra* note 18, at 113 (analogizing the environmental movement to the movement to keep information in the public domain).

79. See RACHEL CARSON, *SILENT SPRING* (1962) (noting that the emergence of the contemporary environmentalist movement can be traced to *Silent Spring*, in part). *Silent Spring* was a seminal work that made a significant contribution to the contemporary environmental movement. See Cunningham, *supra* note 21, at 12 n.64. However, to postulate that the environmental movement has an explicit start date is to oversimplify history and undermine the “standing on the shoulders of giants” affect so common in the realm of cultural creation and production. *Id.* Evidence of environmentalism, and the consequential placement value on the *oikos*, is scattered throughout history. *Id.* Contemporary environmentalists have drawn inspiration from the collective wisdom of indigenous peoples, St Francis of Assisi (1181 or 1182-1226), Goethe (1749-1832), Thoreau (1817-1862), Leopold (1887-1942), and Carson (1907-1964) to name but a few. *Id.* Likewise, cultural environmentalism also has its fair share of historical inspirational figures, albeit the time frame is more condensed. *Id.* Inspirational sources within cultural environmentalism, alluded to above, include Jefferson, Madison, Macaulay, Stallman and Boyle. *Id.*

80. See Boyle, *A Politics of Intellectual Property*, *supra* note 18, at 108 n.52 (attributing the works of Pigou and Leopold to the paradigm shift influenced by Rachel Carson).

them or not. Attempts to achieve such expanded accountings, as much as anything, have been the common thread linking the remarkable range of issues that we call environmental law.⁸¹

Contemporary environmentalism and cultural environmentalism share many similar justifications, making the philosophical intersection between the two worth exploring.⁸² As Boyle states:

In both environmental protection and intellectual property, the very structure of the decisionmaking process tends to produce a socially undesirable outcome. Decisions in a democracy are made badly when they are primarily made by and for the benefit of a few stakeholders, be they landowners or content providers.⁸³

Frischmann suggests that this reference to the decision-making process speaks to the core problems of complexity and path dependence in interlinked ecologies.⁸⁴ According to Boyle, contemporary environmentalism:

[G]ained much of its persuasive power by pointing out that for structural reasons we were likely to make bad

81. Zygmunt J.B. Plater, *From The Beginning, A Fundamental Shift Of Paradigms: A Theory And Short History Of Environmental Law*, 27 *LOY. L.A. L. REV.* 981, 981-82 (1994).

82. See Frischmann, *Cultural Environment*, *supra* note 50, at 1090 (noting that, like environmentalism, cultural environmentalism is not a passing fad). It is true that cultural environmentalism as a *phrase* only recently celebrated its tenth birthday by way of a "Cultural Environmentalism @ 10" symposium hosted by Stanford Law School's Center for Internet and Society, but the intellectual foundation of cultural environmentalism draws upon a rich tapestry of historical thought. See Lessig, *Foreword*, *supra* note 68, at 1-3. The first copyright can be traced to the Duke of Milan in 1481, and the Statute of Anne was enacted in 1709. See AUGUST, *supra* note 1, at 469. Hence, although the maximalist tendencies of IPRs did not begin in earnest until the second half of the twentieth century, it is submitted that the heritage of cultural environmentalism is found in the passing of centuries rather than the passing of decades. See *id.*

83. Boyle, *A Politics of Intellectual Property*, *supra* note 18, at 110.

84. See Frischmann, *Cultural Environment*, *supra* note 50, at 1090-91 (acknowledging that the environmental metaphor relates the complexity and dependant nature of the issue).

environmental decisions: a legal system based on a particular notion of what 'private property' entailed and an engineering or scientific system that treated the world as a simple, linearly related set of causes and effects.⁸⁵

In both types of environmentalism, the environment itself is left out of the analysis.⁸⁶ It is therefore of no surprise that the environment was not conserved.⁸⁷ The same might be said in relation to the public domain.⁸⁸

The invention of "the environment," however, has been no slight task for contemporary environmentalism. Despite the rich philosophical history of environmentalist thought, contemporary environmentalists have found it necessary to rely upon several distinct analytical frameworks to advance environmental claims.⁸⁹ In no specific order, the first exemplary analytical framework is that of *ecology*, the comprehensive study concerning the connection of the variable, fragile and complex interrelationships between living systems.⁹⁰ The second is that of *the commons*, how it is used, regulated and controlled.⁹¹ The third is *public choice theory*, which speaks of the power of incumbents to shape law in their favor.⁹² The fourth is *welfare economics*,

85. BOYLE, THE PUBLIC DOMAIN, *supra* note 35, at 241.

86. See BOYLE, THE PUBLIC DOMAIN, *supra* note 35, at 241 (arguing that an individualistic view causes depletion of the whole).

87. See BOYLE, THE PUBLIC DOMAIN, *supra* note 35, at 241 (noting the effect of incomplete analysis).

88. See BOYLE, THE PUBLIC DOMAIN, *supra* note 35, at 241 (comparing environmental movement to intellectual property rights).

89. See Boyle, *A Politics of Intellectual Property*, *supra* note 18, at 108-09 (referring to two analytical frameworks—ecology and welfare economics). While this is a useful starting point, this paper expands the set of environmental frameworks to include "public choice theory." See Cunningham, *supra* note 21. Prior research by the author has considered "the commons" as an analytical framework. *Id.*

90. See Boyle, *A Politics of Intellectual Property*, *supra* note 18, at 108-09 (defining the ecological framework). The term ecology or oekologie was coined by Ernst Haeckel, the German biologist, in 1866, and further developed by Eugenius Warming when he wrote the first textbook on the matter. See DAVID FRODIN, GUIDE TO STANDARD FLORAS OF THE WORLD 72 (2001).

91. See Boyle, *The Second Enclosure Movement*, *supra* note 29, at 40-44 (summarizing the commons in the second enclosure movement context).

92. See Boyle, *The Second Enclosure Movement*, *supra* note 29, at 72 (highlighting potential downfalls of public choice theory).

which reveals the ways in which markets can fail to take into account negative (and positive) externalities associated with economic actors.⁹³

This article focuses specifically on the analytical framework of public choice theory so as to explore the democratic foundations of social production and the networked public sphere.

IV. Public Choice Theory

Both environmentalism and cultural environmentalism have been implicitly built upon scientific and commons-based discourse.⁹⁴ This discourse has been complemented, within the respective movements, by public choice theory — a theory originated by Buchanan and Tullock in the *Calculus of Consent*.⁹⁵ This theory implies that often poor public decisions are the result of a few well-organized groups with resources and clearly-defined interests competing against larger, decentralized groups which have small interests individually, but cumulatively, their interests are enormous.⁹⁶

Public choice theory can be conceptualized through a neo-pluralist lens, which recognizes that although power and influence are widely spread, the uneven nature of the power distribution has meant that dominant interests have been able to capture the primary decision-making processes.⁹⁷ Public choice theory has transformed the thinking of economists when it comes to government behavior by informing that regulation largely

93. See Boyle, *A Politics of Intellectual Property*, *supra* note 18, at 109 (defining welfare economics).

94. See Cunningham, *supra* note 21, at 14 (discussing the reconciling the theory of the commons with certain aspects of environmentalism and cultural environmentalism).

95. See BUCHANAN, *CALCULUS OF CONSENT*, *supra* note 14, at 63-85 (introducing and explaining the public choice theory).

96. Boyle, *The Second Enclosure Movement*, *supra* note 29, at 72.

97. See ROBERT GRAY, DAVID OWEN & CAROL ADAMS, *ACCOUNTING AND ACCOUNTABILITY* 37 (1996) (summarizing that political and economic power are not distributed with “equality, justice or fairness,” and public participation in the political process could minimize those inequalities).

reflects sectional, as opposed to public, interest.⁹⁸ In this sense, public choice theory binds together economic and political analysis by treating “the legislative process as a microeconomic system in which ‘actual political choices are determined by the efforts of individuals and groups to further their own interests.’”⁹⁹

Olson has relied upon public choice theory to focus attention on what appears, *prima facie*, to be a rudimentary insight that rational people with interests in common will, in many instances, be unwilling to act with others to advance these common interests.¹⁰⁰ A corollary of this perspective is that large collectivities with diffuse interests will be systematically disadvantaged in the political process as compared to smaller groups with more acute interests because larger groups face higher organizing costs and are affected more severely by incentives to free ride.¹⁰¹

Contemporaneously, a broad range of IP scholars have come to use public choice theory to explain the perspective that IP rights holders have a theoretically and practically disproportionate influence on IP lawmaking.¹⁰² The boldest

98. See BUCHANAN, *CALCULUS OF CONSENT*, *supra* note 14, at 78 (critiquing sectional view as bad for collective decision making); NOAM CHOMSKY & EDWARD HERMAN, *MANUFACTURING CONSENT, THE POLITICAL ECONOMY OF THE MASS MEDIA*, at xi (1988) (arguing media radically distorts the flow of information at the behest of private commercial interests).

99. DANIEL FARBER & PHILIP P. FRICKEY, *LAW AND PUBLIC CHOICE: A CRITICAL INTRODUCTION* 14-15 (1991).

100. See MANCUR OLSON, *THE LOGIC OF COLLECTIVE ACTION: PUBLIC GOODS AND THE THEORY OF GROUPS* 2 (1965) (explaining the rational large group mentality that prevents them from making decisions that benefit a common interest).

101. See *Id.* at 46-48, 165-67 (finding that based on the higher cost of operating as a large organization it is only rational for individuals to achieve their interests on their own at lesser opportunity cost).

102. See Mark A. Lemley, *The Constitutionalization of Technology Law*, 15 BERKELEY TECH. L.J. 529, 532-34 (2000) (discussing Congressional regulation of intellectual property); Robert P. Merges, *One Hundred Years of Solitude: Intellectual Property Law, 1900-2000*, 88 CALIF. L. REV. 2187, 2235-36 (2000) (describing ways in which copyright interest groups try to influence legislation); Pamela Samuelson, *Should Economics Play a Role in Copyright Law and Policy?*, 1 U. OTTAWA L. & TECH. J. 1, 9-10 (2004) (pointing out the problems presented by the current copyright law and policy making process); Stewart E. Sterk, *Rhetoric and Reality in Copyright Law*, 94 Mich. L. Rev. 1197, 1244-46 (1996) (stating public choice theory legislation reflects small, organized

articulations of this argument suggest that public choice pressures will exist wherever there are exclusive rights in information. Yochai Benkler, for example, writes:

Our legislative process demonstrates a systematic imbalance in favor of the expansion and deepening of exclusive rights to information at the expense of the public domain. The imbalance exists because the benefits of such rights are clearly seen by, and expressed by, well-defined interest holders that exist at the time the legislation is passed. In contrast, most of the social costs—which are economic, social, political, and moral—are diffuse and likely to be experienced in the future by parties not yet aware of the fact that they will be affected by the extension of rights.¹⁰³

In this context, Lessig proffers a slightly blunter prognosis:

[I]t is an iron law of politics that the organized beat the unorganized and that the vested have interests that get organized over the unknown.... The result is that the pressure in the existing system is biased in favour of the old. Policies get made to favour the old; the interest of the new simply has no voice.¹⁰⁴

Benkler provides a practical example of this public choice phenomenon by discussing the way in which government regulation relating to community radio was effectively squashed by the incumbent radio broadcasters:

Incumbents feared that if listeners have a choice, they might prefer local community programming to what the incumbents have to offer. This fear cut across the commercial/public divide among incumbents, and

groups over general public interests); Timothy Wu, *Copyright's Communications Policy*, 103 Mich. L. Rev. 278, 291-92 (2004) (discussing the process behind copyrights communications regime).

103. Yochai Benkler, *Through the Looking Glass: Alice and the Constitutional Foundations of the Public Domain*, 66 LAW & CONTEMP. PROBS. 173, 196 (2003).

104. LESSIG, *supra* note 19, at 237.

National Public Radio served as the incumbents' poster boy in the fight to silence low power radio.... Low power radio would have offered a fundamentally different model, with extremely low entry barriers, and was therefore likely to offer a platform for speaking, as well as listening. To respond to such a new capability required far too fundamental a change in the way broadcasters work to be permitted.¹⁰⁵

Applying public choice theory to the Australian environmental context, it can be reasoned that while lots of people might be affected by a proposed wood-chipping mill in Tasmania opponents of this proposal are generally not as well organized as the company who plans to operate the mill.¹⁰⁶ It is for this reason that the environmental movement has established a variety of specialized organizations—such as Friends of the Earth, Greenpeace, The Wilderness Society, Launceston Environmental Centre, Tasmanian Conservation Trust, Tasmanian Land Care Fund—that assist in sustaining a coalition of people that attend rallies and donate money even when the particular issue does not directly affect them.¹⁰⁷ Through this strategy, diffuse groups have been able to overcome collective action problems as environmentally conscious citizens have been given the opportunity to outsource their concerns (as well as practical actions such as information gathering) to experts whose norms and pedigree they relate to.¹⁰⁸

105. Yochai Benkler, *Property, Commons and the First Amendment: Towards a Core Common Infrastructure* 43-44 (2001) (working paper) (on file with White Paper for the First Amendment Program Brennan Center for Just. at N.Y.U. Sch. of Law), archived at <http://www.webcitation.org/5t6nBGKeN>.

106. See Jeremy Hance, *A Tasmanian Tragedy?: How the forestry industry has torn an island apart*, MONGABAY.COM (July 02, 2009), archived at <http://www.webcitation.org/5sijDjlbu> (discussing political support behind an Australian company intending to build a wood-chipping mill in Tasmania).

107. See Boyle, *The Second Enclosure Movement*, *supra* note 29, at 72-73 (stating that environmental movements allow people who would otherwise be un-informed and unorganized the chance to come together to solve their concerns and others on a larger scale).

108. See Boyle, *The Second Enclosure Movement*, *supra* note 29, at 72-73 (discussing the relationship between environmentally conscious citizens and experts in the field).

The success of the environmental movement (albeit limited) has been partly based on an implicit understanding of public choice theory and the resulting institutional diversity that stems from this understanding.¹⁰⁹ It is through the unification of otherwise disparate issues and interests that the environmental movement has been able to make headway in the battle for clarity by overcoming the neglect of media and decision-makers.¹¹⁰ Boyle has suggested that IP scholars learn from this experience and turn to the environmental movement for the analytical tools and perception of common interest necessary to create a politics to protect the public domain.¹¹¹ Here the power of cultural environmentalism becomes apparent: to bind a set of individual struggles “over this chunk of the genome and that aspect of computer programs” into a more fundamental struggle concerning macro issues relating to the information environment.¹¹² As implied above, and as Boyle explicitly states:

Just as the duck hunter finds common cause with the bird-watcher and the salmon geneticist by coming to think about “the environment,” so an emergent concept of the public domain could tie together the interests of groups currently engaged in individual struggles with no sense of the larger context.¹¹³

Kapczynski, in her exceptional exposition of the Access to Knowledge (A2K) movement, has powerfully advanced the argument that this process is presently well under way.¹¹⁴

109. See Boyle, *The Second Enclosure Movement*, *supra* note 29, at 72-73 (asserting the importance of the creation of specialized organizations to the environmental movement).

110. See Boyle, *Cultural Environmentalism*, *supra* note 66, at 18 (clarifying an argument is the first step towards convincing people that institutional change is necessary).

111. See Boyle, *A Politics of Intellectual Property*, *supra* note 18, at 108 (comparing the problem to early environmental movement and advocating its analytical tools and unifying party line).

112. See Boyle, *The Second Enclosure Movement*, *supra* note 29, at 72-73 (recognizing the parallelism and a need for the information environment to follow the cultural environment movement’s path).

113. Boyle, *The Second Enclosure Movement*, *supra* note 29, at 73.

114. See Amy Kapczynski, *The Access to Knowledge Mobilization and the New Politics of Intellectual Property*, 117 YALE L.J. 804, 825-39 (2008) (pointing to recent international legislation, standing committees and announced

Kapczynski alludes to a plethora of examples where the public domain, in the broad sense of the term, has united otherwise disparate groups.¹¹⁵ Fortunately, thought and action related to this unification has not solely focused on the *detriments* of the second enclosure, but also on *solutions*.¹¹⁶ After all, cultural environmentalism, as a socio-political movement, is not just about lamenting the dark; it is also about lighting candles.¹¹⁷ While both the Free (Libre) and Open Source Software (FLOSS) movement and Creative Commons are exemplary in this respect, this paper will focus briefly on the former due to its explanatory power within the context of social production.

A. Free (Libre) and Open Source Software

Ostrom's path breaking work on "governing the commons" has replaced the simplistic account of the tragedy of the commons with a more sophisticated discussion concerning the methods of regulating common pool resources.¹¹⁸ It is at this juncture that theory has morphed into practice.¹¹⁹ The FLOSS movement, built upon the traditional legal instruments of contract and license, provides a tangible example of an institutional effort to transform commons theory into commons practice.¹²⁰ The consequence is a space of "public freedom enabled by private choice."¹²¹

With its collaborative and decentralized model, FLOSS provides a counter-example to the classic incentivizing of IP

positions).

115. See *id.* at 826-29 (observing for example agricultural, scientific, and technological groups uniting against certain patents).

116. See *id.* at 829-39 (advocating for free and open source programs, activist coalitions, and legislative reform).

117. See BOYLE, THE PUBLIC DOMAIN, *supra* note 36, at 288 (stressing the importance of seeing beyond criticism and moving forward).

118. See OSTROM, *supra* note 28, 7-17 (introducing the idea of private contracts as means of regulation as opposed to privatization).

119. See, e.g., OSTROM, *supra* note 28, at 61 (noting the implementation of the commons-pool theory into practice).

120. See Eric Ford & Nicholas Taylor, *Free and Open Source Software in Developing Countries*, 17 U. BALT. INTELL. PROP. L.J. 139, 141 (2009) (focusing on adaptability of FLOSS and its vast capacities for developing businesses and countries).

121. Boyle, *Cultural Environmentalism*, *supra* note 110, at 17.

rights making it central to the Access to Knowledge movement¹²² Volunteers create FLOSS, and the General Public License (GPL) that governs it and sustains its collaborative model of production.¹²³ The GPL gives users the right to copy and modify the associated source code and requires that users apply the same rights to any derivative works produced from the licensed software.¹²⁴ Programmers who modify such software must therefore ensure that any improvements are contributed back into the common pool; and in this sense no compensation can be sought through strategies of exclusion from the incremental improvements that flow back into the software.¹²⁵

According to predominant IP law policy, FLOSS simply should not exist.¹²⁶ The fact that it does exist leads cultural environmentalists to postulate that the traditional model of IP misses something fundamental about the necessary conditions of creativity, particularly in the digital information age.¹²⁷ Benkler has advanced this argument most forcefully through his assertion that the networked digital environment facilitates new forms of commons-based social production through its aggregation of individuals at a scale that overcomes motivational and organizational challenges.¹²⁸ Within the digerati, Moglen's

122. Kapczynski, *supra* note 114, at 869-70 (demonstrating that FLOSS generates altruistic, public changes to software which advances public knowledge).

123. See *GNU General Public License*, GNU OPERATING SYSTEM (June 29, 2007), archived at <http://www.webcitation.org/5slTn0TIB> (offering General Public License, which delineates the rules regulating open source software).

124. Josh Lerner & Jean Tirole, *The Scope of Open Source Licensing*, 21 J.L. ECON. & ORG. 20, 22-23 (2002) (stating that the GPL permits copying of code but not for commercial uses).

125. See Kapczynski, *supra* note 114, at 870 (discussing how one can make use of free software and contribute back into the common pool by making improvements to it).

126. See Kapczynski, *supra* note 114, at 870 (noting that everyone who uses free software should contribute back into the common pool).

127. See Kapczynski, *supra* note 114, at 870 (suggesting that intellectual property law does not take into account creativity).

128. See Yochai Benkler, *Coase's Penguin, or, Linux and The Nature of the Firm*, 112 YALE L.J. 369, 444-46 (2002) [hereinafter Benkler, *Coase's Penguin*] (concluding that peer production of information has broad economic implications for information production); Yochai Benkler, *Free as the Air to Common Use: First Amendment Constraints on Enclosure of the Public Domain*,

Metaphorical Corollary to Faraday's Law is often put forward to express this general sentiment: Wrap the Internet around every brain on the planet and spin the planet. Software flows in the wires. It's an emergent property of human minds to create.¹²⁹

Shirky's perspective is also thought provoking:

We have always loved one another. We're human. It's something we're good at. But up until recently, the radius and half-life of that affection has been quite limited. With love alone, you can get a birthday party together. Add coordinating tools and you can write an operating system. In the past, we would do little things for love, but big things, big things required money. Now we can do big things for love.¹³⁰

74 N.Y.U. L. REV. 354, 358-59 (1999) [hereinafter Benkler, *Free as the Air*] (commenting that stricter intellectual property laws will result in constraints on information production and free speech); Yochai Benkler, *Sharing Nicely: On Shareable Goods and the Emergence of Sharing as a Modality of Economic Production*, 114 YALE L.J. 273, 356-57 (2004) [hereinafter Benkler, *Sharing Nicely*] (recognizing the growing use of peer production); BENKLER, *supra* note 20, at 5 (observing the rise of effective large scale cooperative efforts through peer production of information, knowledge, and culture). *But see* Richard Epstein: *Why open source is unsustainable*, FT.COM (Oct. 21, 2004), archived at <http://www.webcitation.org/5slq84F1R>. Epstein's perspective on open source software explains:

The open source movement shares many features with a workers' commune, and is likely to fail for the same reason: it cannot scale up to meet its own successes. To see the long-term difficulty, imagine a commune entirely owned by its original workers who share pro rata in its increases in value. The system might work well in the early days when the workforce remains fixed. But what happens when a given worker wants to quit? Does that worker receive in cash or kind his share of the gain in value during the period of his employment? If not, then the run-up in value during his period of employment will be gobbled up by his successor—a recipe for immense resentment. Yet that danger can be ducked only by creating a capital structure that gives present employees separable interests in either debt or equity in exchange for their contributions to the company. But once that is done, then the worker commune is converted into a traditional company whose shareholders and creditors contain a large fraction of its present and former employers. The bottom line is that idealistic communes cannot last for the long haul. *Id.*

129. Eben Moglen, *Anarchism Triumphant: Free Software and the Death of Copyright*, FIRSTMONDAY.ORG (Aug. 2, 1999), archived at <http://www.webcitation.org/5slrTJyUy> (discussing software as property and the theoretical paradox and practical problems).

130. Clay Shirky, *Supernova Talk: The Internet Runs on Love*, CLAY SHIRKY'S

There is significant literature concerning why the open source system that operates within FLOSS works.¹³¹ Some point to the nature of the gift economy; others to the flowering of an innate love that exists within human beings.¹³² Questions of motivation of the actual open source *participants* have also spawned ample reflections.¹³³ Do people participate because they want to build

WRITINGS ABOUT THE INTERNET (Feb. 1, 2008), *archived at* <http://www.webcitation.org/5sluxxnvG> [hereinafter Shirky, *Supernova Talk*] (discussing the importance of social cohesion in the internet), *noted in* BOYLE, THE PUBLIC DOMAIN, *supra* note 35, at 185; *see also* CLAY SHIRKY, HERE COMES EVERYBODY: THE POWER OF ORGANIZING WITHOUT ORGANIZATIONS 161-72 (2008) [hereinafter SHIRKY, HERE COMES EVERYBODY] (describing interactive telecommunications' impact on the social order and means of organizing large scale protests).

131. *See* Moglen, *supra* note 129 (describing the practical success of free software and open source projects)129; GLYN MOODY, REBEL CODE: THE INSIDE STORY OF LINUX AND THE OPEN SOURCE REVOLUTION 305-323 (2001) (hypothesizing about Linux's future); PETER WAYNER, FREE FOR ALL: HOW LINUX AND THE FREE SOFTWARE MOVEMENT UNDERCUT THE HIGH-TECH TITANS 15-16 (2000) [hereinafter WAYNER, FREE FOR ALL] (discussing the roots of the open-source software movement along with current conflicts within the movement); ERIC RAYMOND, THE CATHEDRAL AND THE BAZAAR: MUSINGS ON LINUX AND OPEN SOURCE BY AN ACCIDENTAL REVOLUTIONARY 141-42 (rev. ed. 2001) [hereinafter RAYMOND, THE CATHEDRAL AND THE BAZAAR] (describing the benefits of open-source software); STALLMAN, *supra* note 16, at 20 (exploring the free software movement's importance in society along with its historical, philosophical, and legal underpinnings); PERSPECTIVES ON FREE AND OPEN SOURCE SOFTWARE 23-46 (Joseph Feller, Brian Fitzgerald, Scott A. Hissam & Karim R. Lakhani eds., 2005) (analyzing motivations behind FLOSS and relevant legal, cultural, and social issues).

132. *See* Brian Fitzgerald & Graham Bassett, *Legal Issues Relating to Free and Open Source Software*, in LEGAL ISSUES RELATING TO FREE AND OPEN SOURCE SOFTWARE 11, 16-17 (Brian Fitzgerald & Graham Bassett eds., 2003) *archived at* <http://www.webcitation.org/5t7J5y4a0> (examining IP rights and their effect on software programs, public domain, and open access); Shirky, *Supernova Talk*, *supra* note 130 (noting that open sources allow humans to do "big things" with just their passion, as opposed to money); *see also* SHIRKY, HERE COMES EVERYBODY, *supra* note 130, at 140-42 (discussing the prospect of electronic media like Wikipedia existing out of human love for the technology and one another).

133. *See* Moglen, *supra* note 129 (describing the evolution and motivational factors associated with the open source and free software movement); MOODY, *supra* note 131 (tracing the development of Linux operating system); WAYNER, FREE FOR ALL, *supra* note 131, at 15-16 (outlining the history and philosophy of free software); RAYMOND, THE CATHEDRAL AND THE BAZAAR, *supra* note 131, at 141-142 (explaining the advantages of the open-source software model); STALLMAN, *supra* note 16, at 20; PERSPECTIVES ON FREE AND OPEN SOURCE SOFTWARE, *supra* note 131, at 23-46 (providing analysis of the motivations behind FLOSS).

their resume so as to acquire a better job; or is it because people just want to create, in the same way that Mozart was compelled to compose music or Monet was drawn to fine art?¹³⁴ Both Benkler and Boyle argue that while these questions are interesting to contemplate and fun to debate, they actually detract attention from more pressing issues.¹³⁵ The reality is that people do participate, for a variety of different reasons, in commons-based social production processes it is not a new phenomenon.¹³⁶ Indeed, in a social landscape of zero copying cost tendencies, and the general intensification of information sharing, it is not all-together surprising that social production is occurring at an increasing rate across a broadening range of activities.¹³⁷ As Boyle states:

One person works for love of the species, another in the hope of a better job, a third for the joy of solving puzzles, and a fourth because he has to solve a particular problem anyway for his own job and loses nothing by making his hack available for all. Each person has their own reserve price, the point at which they say, "Now I will turn off Survivor and go and create something." But on a global network, there are a lot of people, and with numbers that big and information overhead that small, even relatively hard projects will attract motivated and skilled people whose particular reserve price has been crossed.¹³⁸

Creative Commons, Wikipedia, Biological Innovation for the Open Society (BiOS), and other such innovative initiatives demonstrate that the reserve price is being crossed at an exponential rate in a

134. See BOYLE, *THE PUBLIC DOMAIN*, *supra* note 35, at 189 (listing reasons that system works); BENKLER, *THE WEALTH OF NETWORKS*, *supra* note 21, at 91-98 (discussing human motivation).

135. See BOYLE, *THE PUBLIC DOMAIN*, *supra* note 35, at 189 (articulating questions debated are irrelevant).

136. See BENKLER, *THE WEALTH OF NETWORKS*, *supra* note 21, at 98 (concluding that fulfilling our social and psychological needs is motivation structure that social production taps).

137. See STEVEN WEBER, *THE SUCCESS OF OPEN SOURCE* 224-27 (2004) (explaining growth of social production).

138. BOYLE, *THE PUBLIC DOMAIN*, *supra* note 35, at 189-90.

wide-ranging set of circumstances and contexts.¹³⁹ At the heart of these initiatives is the progression of contemporary commons-based, social production methods.¹⁴⁰

V. Social Production and the Networked Public Sphere

The phrase *social production* characterises a subset of commons-based production practices.¹⁴¹ Benkler defines

139. See Lawrence Lessig, *The Creative Commons*, 65 MONT. L. REV. 1, 11-12 (2004) (articulating danger of extremism); Michael Carroll, *Creative Commons and the New Intermediaries*, 2006 MICH. ST. L. REV. 45, 65 (concluding use of Creative Commons licensing continues to grow); Minjeong Kim, *The Creative Commons and Copyright Protection in the Digital Era: Uses of Creative Commons Licenses*, 13 J. OF COMPUTER-MEDIATED COMM. 10 (2007), archived at <http://www.webcitation.org/5spxnsY3y> (portraying production of creative works under Creative Commons licenses); Jerome Reichmann & Paul Uhler, *A Contractually Reconstructed Research Commons for Scientific Data in a Highly Protectionist Intellectual Property Environment*, 66 LAW & CONTEMP. PROBS. 315, 334-336 (2003) (articulating motivations for creation by academic researchers); Niva Elkin-Koren, *Exploring Creative Commons: A Skeptical View of a Worthy Pursuit*, in THE FUTURE OF THE PUBLIC DOMAIN—IDENTIFYING THE COMMONS IN INFORMATION LAW 325, 325-44 (Bernt Hugenholtz & Lucie Guibault eds., 2006) (describing underlying reasons for proliferation of Creative Commons license); DAVID BOLLIER, VIRAL SPIRAL: HOW THE COMMONERS BUILT A DIGITAL REPUBLIC OF THEIR OWN 92-101 (2009) (listing authors, musicians, and technologists that successfully distributed works under Creative Commons license).

140. See BENKLER, *supra* note 20, at 462-64 (noting rise of peer production).

141. See BENKLER, *supra* note 20, at 62 (defining the term peer production). There are a variety of labels given to commons-based, social production practices, such as peer production and distributed creativity. See *id.* The notion of distributed creativity (although not necessarily the phrase) is often attributed to Bill Nichols. See Bill Nichols, *The Work of Culture in the Age of Cybernetic Systems*, 29 SCREEN 22, 22-47 (1988) (discussing particularities of network communication). Perhaps the most important contemporary work relating to distributed creativity is Yochai Benkler, *The Wealth of Networks*, but of course there are many others. See BENKLER, *supra* note 20 (documenting fundamental changes in the production of culture resulting from network communication); CASS SUNSTEIN, INFOTOPIA: HOW MANY MINDS PRODUCE KNOWLEDGE (2006) (synthesizing the effect of the web on the creation of accurate information); CODE: COLLABORATIVE OWNERSHIP AND THE DIGITAL ECONOMY (Rishab Ghosh ed., 2005) (exploring issues related to the creation of open-source software); SHIRKY, HERE COMES EVERYBODY, *supra* note 130 (describing Web 2.0 and interactive telecommunications' impact on the social order); ERIC VON HIPPEL, DEMOCRATIZING INNOVATION (2005) (presenting benefits of user-centered innovation); Dan Hunter & Greg Lastowka, *Amateur-to-Amateur*, 46 WM. & MARY L. REV. 951, 951-1030 (2004) (examining copyright law and its relationship with decentralized content); JONATHAN ZITTRAIN, THE FUTURE OF THE INTERNET—AND HOW TO STOP IT (2008) (debating the future of the

commons-based production as “radically decentralized, collaborative, and nonproprietary; based on sharing resources and outputs among widely distributed, loosely connected individuals who cooperate with each other without relying on either market signals or managerial commands”.¹⁴² Social production is a subset of commons-based production because in addition to resource management, it also considers the decision-making process of the users.¹⁴³ More specifically then, Benkler defines social production as “production systems that depend on individual action that is self-selected and decentralized, rather than hierarchically assigned.”¹⁴⁴

A. Social Production – Decentralisation and Liberalism

According to Benkler, a vital attribute of social production is that it relies on *decentralized*, micro level decision-makers who are not bound to “follow the signals generated by market-based, firm-based, or hybrid models”.¹⁴⁵ Benkler contrasts centralized production methods implicit within market-based and firm-based methods, with the decentralized production methods implicit within social production.¹⁴⁶ As Benkler explains, “centralization” implies the separation of the “locus of opportunities for action from the authority to choose the action that an agent will undertake;” “decentralization,” on the other hand, implies conditions “under which the actions of many agents cohere and are effective despite the fact that they do not rely on reducing the number of people whose will counts to direct effective action.”¹⁴⁷

To be sure, information production that relies upon a decentralized, non-proprietary model, where many contribute to a body of knowledge without anticipating the exclusion of those

internet).

142. BENKLER, *supra* note 20, at 60.

143. Frischmann, *Cultural Environment*, *supra* note 50, at 1111.

144. BENKLER, *supra* note 20, at 62.

145. BENKLER, *supra* note 20, at 60.

146. *See* BENKLER, *supra* note 20, at 64 (noting market dominance of free-software over proprietary options).

147. BENKLER, *supra* note 20, at 62.

who omit payment, is not innovative *per se*.¹⁴⁸ The disciplines of science, law, education and music all provide examples of this type of information production.¹⁴⁹ The digitally networked environment; however, has the effect of amplifying the potential of nonproprietary, decentralized modes of production as the Internet facilitates widely dispersed agents to adopt radically decentralized cooperation strategies.¹⁵⁰ It is the *decentralizing* properties of social production that has led scholars such as Benkler to espouse, based on classic liberal philosophy, the democratically transformative potential of social production.¹⁵¹

The reader of *The Wealth of Networks* is left without doubt that Benkler's work is grounded in the philosophy of classic liberalism and the ongoing project of democratic transformation. The title of Benkler's book is of course an inference to Adam Smith's *The Wealth of Nations*, which despite coming to symbolize market fundamentalism, might be better interpreted as an ethically guided plea to decentralize power and transform the democratic landscape.¹⁵² As Smith perceived 'the market' as a mechanism to siphon power away from the monarchy, it could well be argued that he was just as concerned with the decentralization of power as other classical liberalists such as David Hume or John Stuart Mill.¹⁵³

Indeed, the John Stuart Mill preface quote in *The Wealth of Networks* provides yet further exemplification of Benkler's

148. See Boyle, *The Second Enclosure Movement*, *supra* note 29, at 47 (asserting that an open source method of production is not an unfamiliar idea).

149. See Boyle, *The Second Enclosure Movement*, *supra* note 29, at 47 (providing examples of non-proprietary models).

150. See BENKLER, *supra* note 20, at 3 (explaining nonproprietary modes of production have a more significant role online than in industrialized information economy).

151. See BENKLER, *supra* note 20, at 32-33 (arguing that the low entry barriers of an open source model allow for a decentralized system).

152. See James E. Alvey, *Adam Smith's Higher Vision of Capitalism*, 32 J. ECON. ISSUES 441, 447 (1998) (summarizing Smith's view of capitalism and conception of ideal government role).

153. See Phillip E. Johnson, *Do You Sincerely Want to Be a Radical?*, 36 STAN. L. REV. 247, 256 (observing prominent classical liberalists and their focus on decentralization).

classical liberal leanings, and indeed in Part Two of this book Benkler expends great time and energy analyzing liberal commitments.¹⁵⁴ The result is a meticulous and methodical account of the liberal normative stakes concerning the ongoing battles over institutional ecologies and the consequential social development of the cultural environment.¹⁵⁵ It is within this context that opportunities abound to advance a new form of constitutionalism that may seek to separate power along the *economic* axis rather than the axis of *politics*.

As power has shifted from the public sphere to the private sphere over the past several decades, the need to focus on the role of speech and constitutionalism *in the private domain* has become amplified.¹⁵⁶ How, for example, do the laws relating to intellectual property, competition, contract and technology law relate to the notion of “free speech”? In the U.S., this question can be put in more specific terms: how does the First Amendment inform the private sphere?¹⁵⁷ The pressing constitutional

154. See BENKLER, *supra* note 20, at vi (quoting JOHN STUART MILL, ON LIBERTY (1859)).

The preface to *The Wealth of Networks* reads quotes:

Human nature is not a machine to be built after a model, and set to do exactly the work prescribed for it, but a tree, which requires to grow and develop itself on all sides, according to the tendency of the inward forces which is a living thing.

Such are the differences among human beings in their sources of pleasure, their susceptibilities of pain, and the operation on them of different physical and moral agencies, that unless there is a corresponding diversity in their modes of life, they neither obtain their fair share of happiness, nor grow up to the mental, moral, and aesthetic stature of which their nature is capable.

BENKLER, *supra* note 50, at vi.

155. See Frischmann, *Cultural Environment*, *supra* note 50, at 1118 (introducing Benkler’s analysis of a wide range of normative commitments).

156. See BRIAN FITZGERALD, ANNE FITZGERALD, GAYE MIDDLETON, YEE FEN LIM & TIMOTHY BEALE, INTERNET AND E-COMMERCE LAW: TECHNOLOGY, LAW AND POLICY 25-27 (2007) [hereinafter FITZGERALD, *Internet & E-Commerce Law*] (commenting on digital constitutionalism).

157. See Marci Hamilton, *Database Protection and the Circuitous Route Around the United States Constitution*, in INTERNATIONAL INTELLECTUAL PROPERTY AND THE COMMON LAW WORLD 9, 26-28 (Charles E. F. Rickett & Graeme W. Austin eds., 2000) (explaining that the Copyright Clause, in conjunction with the First Amendment, encourages creative activity and results in a proliferation of diverse view points); see also LAWRENCE LESSIG, CODE AND OTHER LAWS OF CYBERSPACE 164-85 (1999) (discussing the regulators of free speech); Jack M. Balkin, *Virtual Liberty: Freedom to Design and Freedom to Play in Virtual*

question, at least from the U.S. perspective, is whether the U.S. Supreme Court will inadvertently delve into civil society by determining the constitutionality of legislation such as the Copyright Act or the Patent Act.¹⁵⁸ In this context, Fitzgerald postulates that contemporary constitutionalism may well depend, at least in part, on courts recognizing that fundamental issues of patent, copyright, contract, and competition/antitrust laws are the constitutional questions of the information age.¹⁵⁹ This recognition may not occur through First Amendment jurisprudence, but rather through a broader appreciation of the dynamic constitutive choices being made in adjudicating upon issues of interpretation of the private law.¹⁶⁰

While the micro and macro legal constitutional battles concerning the public and private sphere will perhaps continue unabated, social production may already be having an important “constitutional” affect in simultaneously transforming and consolidating the power of civil society, and in doing so separating economic power that has accumulated as a corollary

Worlds 90 VA. L. REV. 2043, 2057-62 (suggesting that the First Amendment protects freedom in virtual worlds); Benkler, *Free as the Air*, *supra* note 128, at 364-94 (describing various constraints and conflicts arising between copyright claims and the First Amendment); Benkler, *supra* note 105, at 8 (articulating the two roles that the First Amendment plays in the relationship between the proprietary and the common domains); *but see* Eldred v. Ashcroft, 537 U.S. 186, 218-22 (2003) (rejecting the argument that the Copyright Term Extension Act violated the plaintiff’s First Amendment rights); S.F. Arts & Athletics, Inc. v. U.S. Olympic Comm., 483 U.S. 522, 535 (1987) (stating that commercial speech receives limited First Amendment protection); Harper & Row, Publishers, Inc. v. Nation Enters., 471 U.S. 539, 560 (1985) (declining to expand the doctrine of fair use to create a public figure exception to copyright in light of the First Amendment protections already embodied in the Copyright Act); *Zacchini v. Scripps-Howard Broad. Co.*, 433 U.S. 562, 578 (1977) (holding that even though Ohio law privileges the press constitutional protection in including matters of public interest in its newscasts, the First and Fourteenth Amendments do not require it to do so).

158. See FITZGERALD, *Internet & E-Commerce Law*, *supra* note 156 (questioning whether the U.S. Supreme Court will rule on constitutionality of intellectual property acts).

159. See FITZGERALD, *Internet & E-Commerce Law*, *supra* note 156 (noting constitutional relevance of intellectual property questions).

160. See FITZGERALD, *Internet & E-Commerce Law*, *supra* note 156 (recognition of stronger intellectual property rights may not be based on traditional First Amendment analysis).

of the centralization of firm/market production.¹⁶¹ This perspective relies upon a macro interpretation of constitutionalism that focuses on the regulation or limitation of the vertical exercise of public power over citizens.¹⁶²

161. See DAVID HELD, *DEMOCRACY AND THE GLOBAL ORDER: FROM THE MODERN STATE TO COSMOPOLITAN GOVERNANCE* 50 (1995) [hereinafter Held, *Democracy*] (outlining theory that creation of a liberal state democratizes government). A traditional perspective of civil society espoused by Gramsci is the paradoxical notion that in drawing upon civil society to strengthen democracy it may be necessary to transform civil society itself. See Kevin Magill, *Justifications for Violence*, in 2 *ENCYCLOPEDIA OF VIOLENCE, PEACE & CONFLICT* 269, 281 (Lester Kurtz ed. 2008) (discussing justifications for violence in political transformation). This is because, as Gramsci argued, much of contemporary civil society may indeed form the 'outer earthworks' of the state and/or the market since the ruling class often implicitly use civil society as a way of maintaining their 'hegemony' or dominance in society. See *id.* Indeed, Pateman suggests that the state and the market are inescapably locked into the maintenance and reproduction of the inequalities of every day life, and there are therefore few, if any, realms of private life untouched by politics. See CAROL PATEMAN, *THE PROBLEM OF POLITICAL OBLIGATION: A CRITIQUE OF LIBERAL THEORY* 173 (Univ. of Cal. Press 1985) (1979) (discussing state management of a capitalist economy). Moreover, Barns argues that "the administrative systems of state bureaucracies and the culture of consumer capitalism increasingly pervade and undermine supposedly autonomous private spaces of family and community life." Ian Barns, *Environment, Democracy and Community*, 4(4) *ENVTL. POL.* 101 (1995), reprinted in *ECOLOGY AND DEMOCRACY* 101, 107 (Freya Mathews ed. 1996). It is for this reason that civil society may require transformation so as to create an alternative hegemony of the subordinate classes, which in turn makes it possible to challenge current state or market power. See Benkler, *supra* note 20, at 280-81. It is in this context that the Internet as a technology, and the networked information economy as an organizational and social model of information and cultural production, volunteer the emergence of a substantial alternative platform for the public sphere. See *id.* While the Internet does not escape the hegemonic influence of the ruling class, it does provide an example of a complex modern democracy whose public sphere is built on a platform that is widely distributed and, at least from its inception, partly independent of both government control and market demands—although of course many scholars would argue that such attributes of the Internet are currently under threat. See *id.* at 213-15.

162. See *MODERNITY: AN INTRODUCTION OF MODERN SOCIETIES* 72 (Stuart Hall et al., eds., 1996) (stressing the need to limit vertical public power to help separate economic power). "Constitutionalism or the constitutional state refers to implicit and/or explicit limits on political or state decision-making, limits which can be either procedural or substantive Constitutionalism defines the proper forms and limits of state action." *Id.* The likes of Machiavelli, Montesquieu, Madison and Macaulay have all made important contributions with regard to ensuring that power is separated. See CHARLES HOWARD MCILWAIN, *CONSTITUTIONALISM: ANCIENT AND MODERN* 44-45, 145 (The Law Book Exch., Ltd. 2006) (1947) (discussing Machiavelli and Montesquieu's philosophy); James Madison, *Aspects of Monopoly One Hundred Years Ago*, reprinted in *HARPER'S MONTHLY MAGAZINE: DECEMBER 1913 TO MAY 1914*, at 489,

B. Civil Society and Public Sphere

Within *The Wealth of Networks*, Benkler explores the relationship between social production and the general liberal project of fostering civil society and the related public sphere.¹⁶³ It is civil society that facilitates a space where humanity acts without state or economic tutelage, and the resulting social networks that provide scope for human flourishing and interaction as envisaged by Mill's liberalism.¹⁶⁴ The civil society and public sphere dimensions of liberalism are crucial because they assist in developing a politic which gives all viewpoints a fair hearing.¹⁶⁵ In terms of Charney: The public sphere is where people can discuss matters of mutual concern as peers, and learn about facts, events, and the opinions, interests, and perspectives

490 (1914) (summarizing Madison's objections to monopolies in intellectual property); SEAN LANG, PARLIAMENTARY REFORM: 1785-1928 30-34 (1999) (recognizing Macaulay's significance in the Reform Act of 1832 which separated power in England). Machiavelli, for instance, was of the view that the instability of all singular constitutional forms suggests that only a governmental system combining elements of monarchy (state), aristocracy (market), and democracy (civil society) can promote the kind of culture on which *virtu* depends. See NICCOLÓ MACHIAVELLI, THE DISCOURSES 29-35 (Bernard Crick Ed. 1983) (1531) (advocating for mixed government philosophies). More contemporaneously, Offe has advocated the need for a balance and tension between the main distributive forces of state, market, and community. See Eva Cox, *Adding Ethics and Equity to the Economic Equation*, 82 CHAIN REACTION 2-3 (2000). Whether the relevant power is political-, economic- or community-based is not the critical factor, particularly since power does not necessarily differentiate in its application to subjects. See MICHEL FOUCAULT, POWER/KNOWLEDGE 93, 189 (Colin Gordon ed., Colin Gordon et al. trans., 1980) (discussing social and political sources of power). "Every relation of force implies at each moment a relation of power (which in a sense is its momentary expression) and every power relation makes a reference, as its effect but also as its condition of possibility, to a political field of which it forms a part. To say that 'everything is political', [sic] is to affirm this ubiquity of relations of force and their immanence in a political field . . ." *Id.* at 189. See also C. H. MCLWAIN, CONSTITUTIONALISM AND THE CHANGING WORLD (1939).

163. See BENKLER, *supra* note 20, at 273-300 (arguing that cultural production in the networked information economy fosters greater participation); see also Neil Weinstock Netanel, *Copyright and a Democratic Civil Society*, 106 Yale L.J. 283, 341-47 (1996) (discussing the relationship between intellectual property and civil society).

164. See Glen Lehman, *Disclosing new worlds: a role for social and environmental accounting and auditing*, 24 ACCT. ORGS. & Soc'Y 217, 224 (1999).

165. See *Id.*

of others.¹⁶⁶ Discourse on values, norms, laws, and policies generates politically relevant public opinion.¹⁶⁷ These discussions can occur within various units of civil society (thus we can speak of multiple “public spheres” or “civil publics”).¹⁶⁸ But there is also larger public sphere that mediates among the various mini-publics that emerge within and across organisations of concerned citizens, and informal social networks in the conception of public opinion.¹⁶⁹

The concept of the public sphere might be seen as the normative core of the idea of civil society and the heart of any conception of democracy.¹⁷⁰ Without the concept of the public sphere and the resulting communities of disagreement, civil society talk becomes hopelessly one-sided and analytically useless.¹⁷¹ After all, relationships among people in the public sphere enhance trust and social capital.¹⁷² Whether the *raison d'être* of the public sphere — openness, inclusiveness and fairness — has ever actually been realized is a source of contention.¹⁷³ Nevertheless, the public sphere in the eighteenth century did represent a “third space” to serve as a bridge between domestic and state concerns.¹⁷⁴ This third space was fueled by both increased literacy and low printing costs in Europe.¹⁷⁵ Habermas argues that such a space was virtually non-

166. See Evan Charney, *Political Liberalism, Deliberative Democracy, and the Public Sphere*, 92 AM. POL. SCI. REV. 97, 97-98 (1998) (acknowledging that the public sphere is a place where people can deliberate freely and anonymously).

167. See *Id.*

168. See *Id.* at 97 (acknowledging the existence of multiple public spheres).

169. See *Id.* at 102 (noting that the larger domain encompasses smaller public associations).

170. See Charney, *supra* note 166, at 98 (analyzing the concept of the public sphere within the context of political liberalism and democratic discourse).

171. See Charney, *supra* note 166, at 98.

172. See Charney, *supra* note 166, at 98.

173. See Siva Vaidhyanathan, *The Anarchist in the Coffee House: A Brief Consideration of Local Culture, The Free Culture Movement, and Prospects for a Global Public Sphere*, 70 LAW & CONTEMP. PROBS. 205, 205-06 (2007). One of the primary contestations is that, in the eighteenth century at least, the public sphere consisted primarily of participants of the male bourgeoisie profile. *Id.*

174. *Id.* at 205.

175. *Id.* at 205.

existent in Europe before the eighteenth century and that by the closing of the nineteenth century, it was subject to some considerable transformations.¹⁷⁶ Vaidhyanathan postulates that by the beginning of the twentieth century, “the corporatisation of communications functions across nation-states had drained the bourgeois public sphere of its deliberative potential and much of its purpose.”¹⁷⁷

At the dawn of the twenty first century, however; Habermasian yearnings of rational discourse with liberatory potential seem to have been reignited, particularly within the context of the Internet and broad-scale social production.¹⁷⁸ Vaidhyanathan acknowledges this through his argument that cultural environmentalism is, in fact, Habermasian in the sense that it “stimulates and encourages public sphere” activities around the globe, and by contending that its early success “is a testament to the political potential of public choice theory.”¹⁷⁹

176. See JURGEN HABERMAS, *THE STRUCTURAL TRANSFORMATION OF THE PUBLIC SPHERE: AN INQUIRY INTO A CATEGORY OF BOURGEOIS SOCIETY* 141-42 (MIT Press 1996) (1962) (emphasizing the transition from the public sphere to the private realm with increase state interventionism noticeable during the last quarter of the nineteenth century onward); JURGEN HABERMAS, *BETWEEN FACTS AND NORMS: CONTRIBUTIONS TO A DISCOURSE THEORY OF LAW AND DEMOCRACY* 366 (Thomas McCarthy ed., William Rehg trans., MIT Press 1996) (1992) (noting that the transfer of topics from the private to the public sector caused the public and private spheres to come together in European societies in the seventeenth and eighteenth centuries).

177. Vaidhyanathan, *supra* note 173, at 206.

178. See Vaidhyanathan, *supra* note 173, at 206 (linking emergence of Internet in public consciousness to reexamination of Habermasian concepts).

179. *Id.* at 207 (recognizing Free Culture Movement as Habermasian); see also LAWRENCE LESSIG, *FREE CULTURE: HOW BIG MEDIA USES TECHNOLOGY AND THE LAW TO LOCK DOWN CULTURE AND CONTROL CREATIVITY* 173 (2004) (arguing that copyright has become unbalanced in favor of corporate interests); BOYLE, SHAMANS, SOFTWARE, AND SPLEENS, *supra* note 45, at 156-67 (declaring contemporary IP notions outmoded and counterproductive); PETER DRAHOS P. & JOHN BRAITHWAITE, *INFORMATION FEUDALISM: WHO OWNS THE KNOWLEDGE ECONOMY?* 10-13 (2002) (tracing history of TRIPS agreement and its economic impact on developing countries); LESSIG, *supra* note 19, at 240-61 (illustrating limitation imposed by Congress on creativity and intellectual freedom on the internet); SIVA VAIDHYANATHAN, *COPYRIGHTS AND COPYWRONGS: THE RISE OF INTELLECTUAL PROPERTY AND HOW IT THREATENS CREATIVITY* 35-81 (2001) (detailing historical evolution of copyright law); Siva Vaidhyanathan, *Remote Control: The Rise of Electronic Cultural Policy*, 597 ANNALS AM. ACAD. POL. & SOC. SCI. 1, 4-8 (2005) (characterizing electronic cultural policy and resultant global disobedience). Vaidhyanathan employs the phrase Free Culture Movement,

Benkler and Rheingold also optimistically interpret the practice of social production and the emergence of impressive and efficient organizational practices as a sign that the Habermasian notions might be realised in the form of digital signals and democratic culture.¹⁸⁰

While there is a risk of overstating the role of social production in the macro constitutional context, this paper argues that contemporary social production is presently realizing some important constitutional and civil society functions. In doing so, social production is competing with other dominant modes of production such as state-, firm-, and market-based production.¹⁸¹

rather than cultural environmentalism. Vaidhyathan, *supra* note 173, at 206. Also note that Vaidhyathan warns that the Habermasian question for the public sphere of the Net may be met with an ill-fate. *Id.* at 208. "Habermas's Public Sphere is as temporally and geographically specific as Benedict Anderson's notion of 'imagined communities' and similarly has been inflated to cover disparate experiences that do not precisely map to the specific historical experience the original work covers". *Id.* at 207 (quoting BENEDICT ANDERSON, *IMAGINED COMMUNITIES: REFLECTIONS ON THE ORIGIN AND SPREAD OF NATIONALISM* (2nd ed. 1991)).

180. See BENKLER, *supra* note 20, at 122-27 (noting an increase in overall productivity in industries where social production is effective); HOWARD RHEINGOLD, *SMART MOBS: THE NEXT SOCIAL REVOLUTION* 29-63 (2002) (describing new communication technologies and evolving social practices); HOWARD RHEINGOLD, *THE VIRTUAL COMMUNITY: HOMESTEADING ON THE ELECTRONIC FRONTIER* 25-57, 109-205 (Rev. ed. 2000) (exploring formation of virtual communities and the nature of the relationships formed therein). In order for the Internet and resulting cultural production to become a truly global public sphere, global and equitable access to information technology services must be forthcoming. Boyle, *A Politics of Intellectual Property*, *supra* note 18, at 94-95 (mentioning dangers posed by disparate access to information technologies). Unfortunately, as welfare economics informs, the market is unlikely to deliver equitable outcomes concerning access to information technology services because "the market measures the value of a good by whether people have the ability and willingness to pay for it." BOYLE, *THE PUBLIC DOMAIN*, *supra* note 35, at 2. In general, this creates a situation where "the whims of the rich become more 'valuable' than the needs of the destitute." *Id.* As Boyle puts it: We may spend more on pet psychiatry for the traumatized poodles on East 71st Street than on developing a cure for sleeping sickness, because the emotional well-being of the pets of the wealthy is "worth more" than the lives of the tropical world's poor. *Id.*

Or in a similar vein, "[d]rugs for mental illness, hypertension and erectile dysfunction are where the [pharmaceutical] blockbusters are, not tropical diseases." PETER DRAHOS P. & JOHN BRAITHWAITE, *supra* note 179, at 167.

181. See BENKLER, *supra* note 20, at 122-27 (detailing interactions between social production and market based businesses).

The success of this tendency will, to a large extent, be influenced by the economic fundamentals of social production; which in turn will be guided by a comparative advantage analysis of social production when pitted against the alternate production modes.¹⁸²

C. Comparative Advantage of Social Production: The Hardware-Code-Content Paradigm

As Benkler states, the practice of social production methods are “not as a second best or a contingent remainder from the Middle Ages, but because at some things the non-proprietary [social] production system... is simply better.”¹⁸³ As a practical matter, there are some established criteria for determining whether social production methods can extend to a new technology, such as biotechnology or nanotechnology.¹⁸⁴ The hardware-code-content paradigm discussed in Benkler’s germinal article *Coase’s Penguin, or, Linux and the Nature of the Firm* is particularly valuable in this regard.¹⁸⁵ The first step within this paradigm is to divide the technology into layers.¹⁸⁶ The Internet for instance consists of three layers: firstly, *hardware* which represents the machinery that facilitates the network; secondly, *code* which facilitates the information

182. See BENKLER, *supra* note 20, at 106-16 (analyzing conditions under which social production carries reduced transaction costs).

183. Benkler, *Coase’s Penguin*, *supra* note 128, at 382; see also Richard Nelson, *The Simple Economics of Basic Scientific Research*, 67 J. POL. ECON. 297, 303-04 (1959) (discussing economic motivations for conducting basic scientific research); Rebecca Eisenberg, *Public Research and Private Development: Patents and Technology Transfer in Government-Sponsored Research*, 82 VA. L. REV. 1663, 1715-24 (1996) (highlighting entrenchment in policy of transferring government owned patents to private sector).

184. See Yochai Benkler, *From Consumers to Users: Shifting Deeper Structures of Regulation*, 52 FED. COMM. L.J. 561, 562 (2000) (recognizing contrasting regulatory approaches of peer users and active producers).

185. See Benkler, *Coase’s Penguin*, *supra* note 128, at 384-91 (discussing collaborative creation through Internet); see also Benkler, *Sharing Nicely*, *supra* note 128, at 353-57 (illustrating sharing information through network communication).

186. See Benkler, *supra* note 184, at 562-63 (outlining the different layers of the Internet); LESSIG, *supra* note 19, at 23-25 (articulating the notion of layers from Yochai Benkler); Benkler, *Coase’s Penguin*, *supra* note 128, at 384-91 (discussing the content layer of the Internet).

travelling over the network; and thirdly, *content* which is the actual information communicated.¹⁸⁷ In *The Future of Ideas*, Lessig discusses how these layers apply to various traditional modes of communication, such as the Speaker's Corner in London, to the arts, books, and music.¹⁸⁸ In each area, the different layers that may be either controlled or open can be teased out.¹⁸⁹

As Lessig argues, under Benkler's criteria, the best candidate for open source development is generally the *code* layer because code is usually "modular," "granular," and exhibits relatively "low-cost integration."¹⁹⁰ To flesh out these characteristics: firstly, modularity relates to whether the project can be divided into asynchronous components.¹⁹¹ This is because asynchronous components allow individuals to choose independently of each other what to contribute and when, which in turn maximises their ability to define the nature, extent, and timing of their participation within a project.¹⁹² This characteristic is critical since the self-direction of creative and intellectual input is essential within the context of social production.¹⁹³ Secondly, the modules must be "fine-grained," meaning that each module is sufficiently small in terms of the time and effort that an agent must expend in order to produce a module.¹⁹⁴ To this end, the number of people who are likely to participate in a project is inversely related to the size of the

187. See LESSIG, *supra* note 19, at 23 (describing the three distinct layers that make up the Internet).

188. See LESSIG, *supra* note 19, at 24 (elucidating notion of layers); see also David Opderbeck, *The Penguin's Genome, or Coase and Open Source Biotechnology*, 18 HARV. J.L. & TECH. 167, 170-71 (2004) (discussing the layers notion in an organic communication system).

189. See Opderbeck, *supra* note 188, at 170-72 (arguing that an open source approach may be inappropriate when it is applied to biotechnology). Note this is a topic that is definitely in need of further research in the realm of technological innovation, particularly as it relates to biotechnology and nanotechnology. *Id.*

190. See LESSIG, *supra* note 19, at 138 (discussing a number of sources of innovation encouragement).

191. See LESSIG, *supra* note 19, at 293 n.20 (discussing modular systems).

192. See LESSIG, *supra* note 19, at 92 (stipulating the function of modularity).

193. See LESSIG, *supra* note 19, at 204 (articulating that creativity is essential to social production).

194. See LESSIG, *supra* note 19, at 293 n.20 (describing modular systems).

smallest-scale contribution necessary to produce a usable module.¹⁹⁵ Hence, if the finest-grained contributions are relatively large, requiring large investment of time and effort, the number of potential contributors diminishes.¹⁹⁶ Consequently a significant proportion of the modules in a large-scale social production project must be relatively fine-grained if the project is to be successful.¹⁹⁷ Thirdly, the cost to integrate the modules must be lower than the value that the component adds to the project.¹⁹⁸

When a project is modular, fine-grained and exhibits relatively low-cost integration, social production may indeed have a comparative advantage over other modes of production.¹⁹⁹ This comparative advantage stems primarily from the criteria of information processing and allocation efficiencies.²⁰⁰

1. Information Processing and Allocation Efficiencies

Firstly, with reference to information processing, markets and firm-based hierarchies are information processes in that they are used to lower the uncertainty that agents are confronted with when making business decisions concerning the best course of action.²⁰¹ The pricing mechanism within markets is one tool used to compare the relative value of alternate actions.²⁰² It allows agents to (imperfectly) measure the opportunity costs implicit within any decision-making process.²⁰³ Within the context of the firm, drawing upon contractual arrangements and property law

195. See LESSIG, *supra* note 19, at 293 n.20 (describing modular systems).

196. See LESSIG, *supra* note 19, at 92 (summarizing two professors' work on the link between innovation and architecture).

197. See LESSIG, *supra* note 19, at 92 (discussing the result of IBM modular design).

198. See LESSIG, *supra* note 19, at 92 (describing the function of IBM modular system).

199. See LESSIG, *supra* note 19, at 92 (describing the function of IBM modular design).

200. See LESSIG, *supra* note 19, at 92 (describing the function of IBM modular design).

201. See Benkler, *Coase's Penguin*, *supra* note 128, at 408 (stipulating market and firm-based hierarchies in information processes).

202. See Benkler, *Coase's Penguin*, *supra* note 128, at 408 (stating the function of market price in information processes).

203. See Benkler, *Coase's Penguin*, *supra* note 128, at 408.

reduces uncertainty, which in turn allows managers to control both people and property respectively.²⁰⁴ This control, however, is not without opportunity cost.²⁰⁵ By commanding employees via contract and controlling property via property law, a boundary is set around the available agents and the set of available resources, which in effect limits the information-flow available to managers.²⁰⁶ In other words, a corollary of boundary-setting (via contract and property) is that it becomes difficult to assess what other agents could have done with these same resources or what else these agents could have done with other resources.²⁰⁷

The crucial point is, that like the price system, hierarchical organisations are in fact an imperfect and leaky medium.²⁰⁸ This is because if relevant information is not introduced properly, it will not “count” in the decision process and is lost.²⁰⁹ This has been appreciated for the last decade by the knowledge-management movement within business schools, which has concerned itself with *inter alia* how to moderate the leaky nature of managerial hierarchies.²¹⁰ Eric Raymond in his classic open source article, *The Cathedral and the Bazaar*, also makes reference to the leaky nature of hierarchies by drawing upon the following musings of the anarchist philosopher, Pyotr Alexeyvich Kropotkin:

Having been brought up in a serf-owner’s family, I entered active life, like all young men of my time, with a great deal

204. See Benkler, *Coase’s Penguin*, *supra* note 128, at 408 (describing the function of firms in information processing systems).

205. See Benkler, *Coase’s Penguin*, *supra* note 128, at 411 (discussing the limitation of firms in information processing systems).

206. See Benkler, *Coase’s Penguin*, *supra* note 128, at 411 (summarizing drawbacks of firms in information processes).

207. See Benkler, *Coase’s Penguin*, *supra* note 128, at 411 (discussing the limitation of firms in information processing systems).

208. See Benkler, *Coase’s Penguin*, *supra* note 128, at 411 (opining that neither a price nor a firm-based system is a perfect medium in information processes).

209. Benkler, *Coase’s Penguin*, *supra* note 128, at 411.

210. See Benkler, *Coase’s Penguin*, *supra* note 128, at 411 (noting that concerns over imperfect price and firm-based organization date back a decade), *quoted in What Is Knowledge Management?*, BRINT.COM, Oct. 11, 2010, archived at <http://www.webcitation.org/5tPZ4jVaz>.

of confidence in the necessity of commanding, ordering, scolding, punishing and the like. But when, at an early stage, I had to manage serious enterprises... I began to appreciate the difference between acting on the principle of command and discipline and acting on the principle of common understanding. The former works admirably in a military parade, but it is worth nothing where real life is concerned, and the aim can be achieved only through the severe effort of many converging wills.²¹¹

Recognizing the leaky nature of markets and firms is an important step in understanding why social production has been successful in relation to initiatives such as FLOSS and Creative Commons.²¹² Namely, social production has lower information opportunity costs when compared with markets or firms.²¹³ This is particularly the case where human intellectual or creativity is a salient factor of production because of the self-identification nature of task allocation within social production.²¹⁴ In essence, this self-identification process is a more effective method of “gathering and utilizing information about who should be doing what than a system that does require” the allocation of tasks via contractual and proprietary specification.²¹⁵

The second factor that gives social production an edge over state-, market-, or firm-based production is the reduced allocation costs in the absence of property.²¹⁶ The crux of this efficiency is that because of greater access to resources there are

211. ERIC RAYMOND, *THE CATHEDRAL AND THE BAZAAR* 52 (rev. ed. 2001).

212. See Benkler, *Coase's Penguin*, *supra* note 128, at 412 (considering peer production to be another ideal organizational model).

213. See Benkler, *Coase's Penguin*, *supra* note 128, at 412 (discussing why peer production is succeeding).

214. See Benkler, *Coase's Penguin*, *supra* note 128, at 414 (asserting that human intellectual effort is central to the information gains of peer production).

215. See Benkler, *Coase's Penguin*, *supra* note 128, at 414 (noting that an organizational model that allows for creativity will be more successful than one which imposes contractual specifications).

216. See Benkler, *Coase's Penguin*, *supra* note 128, at 406-07 (examining the two dimensions in which peer production is more successful than firm or market-based production).

increasing economies of scale.²¹⁷ In essence, the idiosyncratic characteristics of individuals means that the overall productivity of a set of agents and set of resources will increase when there is an unbounded availability of agents and an unbounded set of projects.²¹⁸

Even if in principle the decisionmaker [sic] has information as to who is the best person for a job given any particular set of resources and projects (in other words, if the information gains are assumed away), the transaction or organizational costs involved in bringing that agent to bear on the project may be too great relative to the efficiency gain over use of the resource by the next-best available agent who is within the boundary.²¹⁹

In essence, when an agent has unfettered access to all resources, it is more efficient than if these resources are divided and enclosed.²²⁰

Importantly, this paper is not suggesting that social production will always supplant the state, the market, or the firm. Rather, the argument is more nuanced: where uncodified information and the allocation of human creativity and/or intellectual input are relied upon as the engines of innovation, social production may surpass the advantages of states, markets,

217. See Benkler, *Coase's Penguin*, *supra* note 128, at 406-07 (explaining why the second dimension is efficient).

218. See Benkler, *Coase's Penguin*, *supra* note 128, at 415-16 (acknowledging that the expansive resources available to peer production results in allocation gains).

219. Benkler, *Coase's Penguin*, *supra* note 128, at 416.

220. Benkler, *Coase's Penguin*, *supra* note 128, at 422. The theoretical foundation of this second factor lies with Coase's ideas expounded in R. H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1, 1-2 (1960). Coase's research reasoned that "regulation tended to increase transaction costs (and detract from social welfare) while the market, unfettered, tended to allocate resources efficiently." BENEDICT ATKINSON, *THE TRUE HISTORY OF COPYRIGHT: THE AUSTRALIAN EXPERIENCE* 9 (2007). From a differing viewpoint, "the Coase Theorem demonstrates that the efficient use of resources would not depend on the assignment of property entitlements if transactions costs were non-existent. In doing so, Coase implicitly specifies that property law becomes important only when there are transaction costs." GIUSEPPE MAZZIOTTI, *EU DIGITAL COPYRIGHT LAW AND THE END-USER* 18 (2008).

and/or firms.²²¹ A corollary of this argument is that the advantages of open source production compared with state-, market-, or firm-based production will apply in at least some areas of contemporary innovation.²²² Initiatives such the Biological Innovation for the Open Society (BiOS) in the biotechnological realm demonstrate that this may be the case.²²³ In fact, the BiOS project has proven that the features of the innovative process which are being lost in the context of biotechnology through the tragedy of the anticommons—speed, efficiency, quality, responsiveness to user need—are in fact the same features which are being promoted by the proponents of commons-based, social production generally.²²⁴

In *The Second Enclosure Movement* Boyle implies that the question whether social production can scale further into other domains outside of open source software is perhaps the wrong question.²²⁵ Interestingly, however, he then continues:

[t]here is a chance that a new (or old, but under-recognized) method of production could flourish in ways that seem truly valuable—valuable to free speech, innovation, scientific discovery, the wallets of consumers, what William Fisher call “semiotic democracy,” and

221. See Benkler, *Coase's Penguin*, *supra* note 128, at 381 (proposing that peer production has certain advantages over other models). Note the specific circumstances when social production will surpass the advantages that the other two models may have in triggering or directing human behavior through the relatively reliable and reasonably well-understood triggers of money and hierarchy is a matter for more detailed study. *Id.* For a discussion of the notion of “uncodified” see discussion *infra* **Error! Reference source not found.**, p. 37.

222. See Janet Hope, *Open Source Biotechnology* 184-185 (Dec. 23, 2005) (unpublished Ph.D. thesis, Australian National University) [hereinafter Hope, *Open Source Biotechnology*] *archived* at <http://www.webcitation.org/5tS1XXTRI> (noting existence of advantages in many areas of biotechnology such as DNA synthesis).

223. See Richard Jefferson, *Science as Social Enterprise: The Cambia BiOS Initiative*, *INNOVATIONS: TECH., GOVERNANCE, GLOBALIZATION*, Fall 2006, at 13-15 [hereinafter Jefferson] (critiquing current biotechnology as controlled by large corporations to the detriment of the poor).

224. See Cunningham, *supra* note 21 (noting that features of commons-based social production contributes to the decrease in biotechnology innovation).

225. See Boyle, *The Second Enclosure Movement*, *supra* note 29, at 47-48 (asserting that legislation prevents social production in certain domains).

perhaps, valuable to the balance between joyful creation and drudgery for hire.²²⁶

Boyle's lingering optimism concerning the scale-ability of social production is seemingly founded on the promise of ensuring that the inputs of information production are not locked away as a corollary of the second enclosure movement.²²⁷ In short, Boyle implies that if IPR maximalist tendencies trump, then commons-based social production may face a Sisyphean battle.²²⁸ Interestingly, within this context, Boyle muses on a tangential point: that innovation, and invention generally, requires "hardware, capital investment, and large-scale real-world data collection—stuff, in its infinite recalcitrance and facticity."²²⁹ In many respects, this hardware imperative is as applicable for commons-based, social production as it is for commercial production.²³⁰ Even traditional social production modalities such as science, law, education and music require a default level of hardware and infrastructure.²³¹ Within the contemporary context, FLOSS simply would not have eventuated without broad scale access to the critical hardware infrastructure of personal computing and telecommunication services.²³²

2. Critical Hardware Infrastructure

Contrasting computer software to biotechnology is one means of ascertaining whether social production methods can in fact scale. CAMBIA has been working on the application of social

226. Boyle, *The Second Enclosure Movement*, *supra* note 29, at 49.

227. See Boyle, *The Second Enclosure Movement*, *supra* note 29, at 48-49 (hoping that legislation does not foreclose the possibility of open source system).

228. See Boyle, *The Second Enclosure Movement*, *supra* note 29, at 48 (acknowledging the eternal battle between opponents and proponents of an open source system).

229. Boyle, *The Second Enclosure Movement*, *supra* note 29, at 47.

230. See Boyle, *The Second Enclosure Movement*, *supra* note 29, at 47 (explaining the hardware imperative).

231. See Boyle, *The Second Enclosure Movement*, *supra* note 29, at 47 (observing that these disciplines followed Boyle's model).

232. See Boyle, *The Second Enclosure Movement*, *supra* note 29, at 47 (noting movement's presence prior to internet, but noting its acceleration affect on FLOSS).

production methods to biotechnology for some time.²³³ While it has undoubtedly had some critical successes, CAMBIAs open source biotechnology methods have not yet proliferated.²³⁴ Presumably one of the obstacles of applying social production to innovations such as biotechnology is the capital-intensive nature of biotechnological processes and procedures.²³⁵ That is, although a computer operating system or software application can be developed with nothing more than “a laptop, an Internet connection and a packet of Doritos,” biotechnology development demands access to bio-informatic data, equipment, and know-how far beyond the reach of a basement hacker.²³⁶

While biotechnological development presently remains more expensive than computer software development, this is primarily because the costs of building the necessary hardware relevant to computer software development—such as the development of operating systems, the laying of fiber-optic cables for fast cheap internet connection and so on—have already been expended.²³⁷ In biotechnology, on the other hand, huge investments are still to be made.²³⁸ In other words, the apparent difference between software and biotechnology development is mostly one of infrastructure development timing.²³⁹ This point has explanatory power in the sense that the monopolistic tendencies currently practiced within biotechnology innovation are the same as those that occurred in the 1980s in relation to

233. See Jefferson, *supra* note 223, at 17-18 (outlining the history of CAMBRIA).

234. See Jefferson, *supra* 223 at 22, 32-33 (offering lack of public confidence in science in agriculture as justification for lack of success).

235. See Jefferson, *supra* 223, at 33 (suggesting large capital input from investors is required with only short-term financial gain).

236. See Hope, Open Source Biotechnology, *supra* note 222, at 223-24 (quoting Kevin Sweeney, *Open Source Biology Workshop*) (discussing the difference between biotechnology research and development and software research and development.).

237. See Hope, Open Source Biotechnology, *supra* note 222, at 224 (articulating the costs associated with software development).

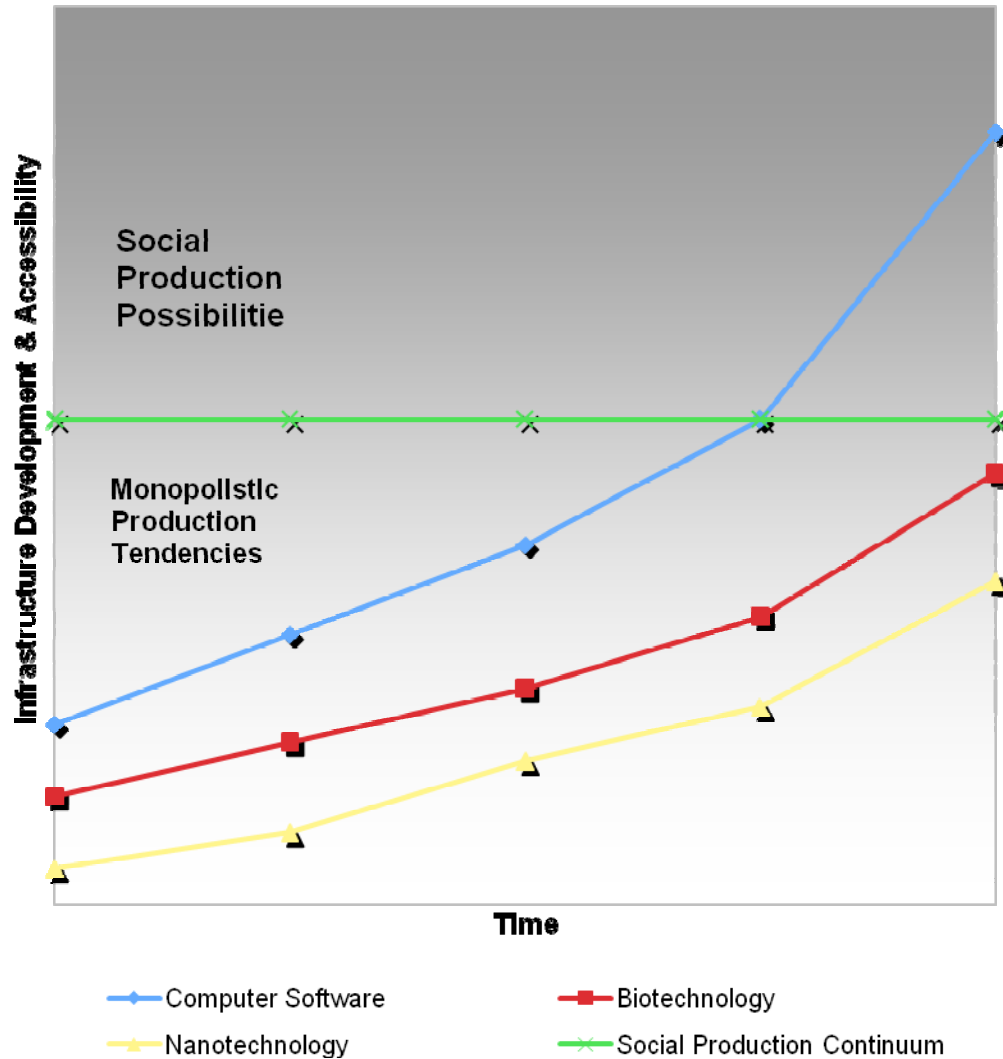
238. See Hope, Open Source Biotechnology, *supra* note 222, at 223-24 (examining the need for infrastructure investments in biotechnology).

239. See Hope, Open Source Biotechnology, *supra* note 222, at 224 (commenting that the need for infrastructure in the software industry is ending while just beginning in the biotechnology industry).

computer software development.²⁴⁰ The following diagram elucidates this point by contrasting the relative infrastructure development and accessibility in relation to computer software, biotechnology and nanotechnology.

240. Susan Wright, *Molecular Politics in a Global Economy*, in PRIVATE SCIENCE: BIOTECHNOLOGY AND THE RISE OF THE MOLECULAR SCIENCES 80, 94-99 (Arnold Thackray ed., 1998) (analyzing computer software development in the 1980s).

Diagram X: Hardware Infrastructure Accessibility and Dominant Modes of Production



With reference to the above diagram, when an industry resides below the social production continuum the mode of production is likely to be dominated by monopolistic production tendencies. When infrastructure development and accessibility within an

industry rises above the social production continuum, social production will become a feasible and desirable part of the overall production mix. In the context of biotechnology, this diagrammatic dynamic is reflected in research undertaken by Graff *et al*, which states that by 1999 the top seven firms in the biotechnological industry, in terms of intellectual asset holdings, controlled three-quarters of patents on transformation technologies and genetic materials, together with close to 100 percent of germplasm patents.²⁴¹ Similarly, in the survey of *Agrobacterium* mediated transformation—a key enabling technology for plant transformation—of twenty-seven key patents in the crucial “vector” category, twenty-six were owned by three institutions; further, all of the patents on binary vectors (which largely supersede earlier vector technologies) were held by a single firm—Syngenta—that also held a dominant position in the “dicot” category (which includes most commercially important crop plants).²⁴²

The history of information and cultural production has generally favoured monopolies (or at least oligopolies) because hardware/infrastructure development has resided below the social production continuum on Diagram X. Presumably, this is because much post-Industrial Revolution production relating to information and culture has been modelled around a capital-intensive, industrial model where expensive physical capital has been the central organising principle.²⁴³ This is true from the “introduction of high-cost, high-volume mechanical presses, through telegraph, telephone, radio, film, records, television, cable, and satellite systems.”²⁴⁴

241. See Gregory Graff *et al*, *Privatization and Innovation in Agricultural Biotechnology*, AGRIC. & RESOURCE ECON. UPDATE, Jan./Feb. 2003, at 5-7 (describing general consequences of privatization in agricultural biotechnology).

242. See Tzvi Tzfira & Vitaly Citovsky, *Agrobacterium-mediated genetic transformation of plants: biology and biotechnology*, 17 CURRENT OPINION IN BIOTECHNOLOGY 147, 147-54 (2006) (defining *Agrobacterium* and discussing production of genetically modified transgenic plants).

243. See Benkler, *Coase's Penguin*, *supra* note 128, at 377 (highlighting past reliance on physical capital in cultural production).

244. See Benkler, *Coase's Penguin*, *supra* note 128, at 377 (enumerating mediums of cultural production).

At some point in time however, as did occur in the computer software industry, the accumulation and accessibility of infrastructure reaches a critical mass. This in turn spurs the inversion of the capital structure of production (within at least some segments of an industry).²⁴⁵ While Diagram X suggests this tipping point may be some distance away in technologies such as biotechnology and nanotechnology, there is at the very least a tendency towards it. Carlson and Brent, for example, have indicated that by some estimates the basic hardware required “for molecular biology research may soon be within reach of individual hobbyists in developed countries and farmer collectives in developing countries” within one decade.²⁴⁶

[C]onsiderable information is already available on how to manipulate and analyse DNA in the kitchen. A recent Scientific American Amateur Scientist column provided instructions for amplifying DNA through the polymerase chain reaction (PCR), and a previous column concerned analysing DNA samples using home-made electrophoresis equipment. The PCR discussion was immediately picked up in a Slashdot.org thread where participants provided tips for improving the yield of PCR. Detailed, technical information can be found in methods manuals, such as Current Protocols in Molecular Biology, which contain instructions on how to perform almost every task needed to perform modern molecular biology, and which are available in most university libraries. More of this information is becoming available online. Many techniques that once required PhD-level knowledge and experience to execute correctly are now performed by undergraduates using kits.... DNA synthesis [is] becoming faster, cheaper, and longer, and it is possible that in ten years specified large stretches of sequence will be generated by dedicated machines. Should this capability be realised, it will move from academic laboratories and

245. See Benkler, *Coase's Penguin*, *supra* note 128, at 377 (describing capital structure of production).

246. Hope, *Open Source Biotechnology*, *supra* note 222, at 184-85 (describing possibility of molecular biology research by hobbyists).

large companies to smaller laboratories and businesses, perhaps even ultimately to the home garage and kitchen.²⁴⁷

Hence, once an industry surpasses the social production continuum reflected in Diagram X, it is likely that in a similar fashion to computer software development, social production will become a feasible and desirable mode of production, at least within particular aspects of the “code” layer of the industry.²⁴⁸ This is especially the case where the code layer is disorganised, or in the terminology of Mandeville “uncodified.”²⁴⁹

3. The Technological Information Continuum

Mandeville establishes the *technological information continuum* by introducing the notions of *codified* and *uncodified* information.²⁵⁰ On the codified end of the technological information continuum are machines, blueprints, trade journal articles and patent specifications.²⁵¹ The uncodified end of the continuum consists of undeveloped ideas and unarticulated know-how.²⁵² According to Hope, “Mandeville’s model is a continuum because there are degrees of codification: for example, information contained in patent specifications will generally be less codified than that embodied in a prototype machine, which in turn is less codified than the information embodied in a mass produced machine.”²⁵³ Innovative processes generally involve codifying uncodified information.²⁵⁴ For the

247. Robert Carlson & Roger Brent, *DARPA Open Source Biology Letter*, MOLSCI.ORG (Oct. 18, 2000), archived at <http://www.webcitation.org/5tVZOWm0R>, quoted in Hope, *Open Source Biotechnology*, *supra* note 222, at 184-85.

248. See Benkler, *Coase’s Penguin*, *supra* note 128, at 404-07 (discussing four attributes of peer production in information production); Carlson, *DARPA Open Source Biology Letter*, *supra* note 247, at 2 (outlining the advantages of social production).

249. See Hope, *Open Source Biotechnology*, *supra* note 222, at 27-28 (articulating Mandeville’s argument that innovation is cumulative social production).

250. See MANDEVILLE, *supra* note 55, at 50-57 (contrasting codified and uncodified information).

251. See MANDEVILLE, *supra* note 55, at 50 (defining codified information).

252. See MANDEVILLE, *supra* note 55, at 50 (defining uncodified information).

253. Hope, *Open Source Biotechnology*, *supra* note 222, at 27.

254. See Hope, *Open Source Biotechnology*, *supra* note 222, at 27 (describing

purpose of this paper, a critical point to be extracted from Mandeville's continuum is that Coase's transactions costs at the uncodified end are higher because uncodified information is by definition often disorganised and therefore "best communicated in person, through practice and 'learning by doing.'"²⁵⁵

In essence, Mandeville has argued that the transfer of uncodified information has high transaction costs, and therefore reduces the efficiency of producing and distributing it through the market.²⁵⁶ Moreover, this inefficiency in the processing of uncodified information has led to the creation of other non-market mechanisms.²⁵⁷ Examples of such non-market mechanisms include "transfer via hierarchies within firms, personal communication networks and personal mobility, open publication, collaboration between technology supplying firms and between technology users and suppliers, and the use of consultants."²⁵⁸

Applying Mandeville's insights to social production, it is argued that FLOSS and its commons-based, social production methodology represent a feasible and desirable mode of production, especially in the transformation process from uncodified information to codified information.²⁵⁹ Ultimately the scale-ability of social production will depend on the cyclical positioning of a given technology and the related infrastructure. While particular aspects of the computer software industry have surpassed the social production continuum (Diagram X), there

relationship between innovation and codified/uncodified information).

255. Hope, *Open Source Biotechnology*, *supra* note 222, at 28 (referencing Mandeville's notions about effects of uncodified information on information transfer). The learning by doing concept acknowledges "that knowledge does not exist in a vacuum, but rather is an interdependent part of an evolving system that also includes practice and technological artifacts." Opderbeck, *supra* note 188, at 208. In this sense "knowledge and innovation typically emerge from a long history of culture and skills acquired from within a community of practice." *Id.*

256. Hope, *Open Source Biotechnology*, *supra* note 222, at 28.

257. Hope, *Open Source Biotechnology*, *supra* note 222, at 28.

258. Hope, *Open Source Biotechnology*, *supra* note 222, at 28, *discussed in* MANDEVILLE, *supra* note 55, at 75 (outlining information flow mechanisms).

259. *See* Hope, *Open Source Biotechnology*, *supra* note 222, at 106-07 (detailing Benkler's arguments about advantages of peer production).

are many other technologies such as biotechnology and nanotechnology that await a similar tendency in the future.²⁶⁰ If this tendency is indeed realised, social production will continue to elicit the separation of (economic) power function that will prove to be democratically critical in the twenty-first century.

VI. Conclusion

It is important not to exaggerate the role of social production in the overall production mix of the global economy. It is, however, equally important not to understate its role. Employing the frame of cultural environmentalism, this paper focused attention on the ‘separation of economic power’ function inherent within social production.

The article began by exploring the correlation between the first enclosure movement and the second enclosure movement. In so doing, the need for the counter-movement of cultural environmentalism became apparent. By utilizing the analytical framework of public choice theory, the paper explored the role of social production and the networked public sphere in revitalizing Habermasian yearnings of “rational discourse with liberatory potential.” The FLOSS movement is but one example of many that delivers not just rational discourse but practical outcomes. The lingering question is whether the production methodology underpinning FLOSS can scale. While many speculations might be proffered as to the political potential concerning the mode of operandi of FLOSS, this article engaged with the economic pragmatics of social production.

Ultimately, the article argued that there are certain conditions and situations where social production may trump other modes of production within the information processing and allocation efficiency realms. Drawing upon Benkler’s hardware-code-content paradigm, it was seen that it is the code layer of a given technology that provides the greatest social production opportunities. The realization of these opportunities will

260. See Hope, Open Source Biotechnology, *supra* note 222, at 225-26 (considering the future of open source biotechnology movement).

depend, at least to some extent, on the cyclical timing of critical hardware infrastructure within a given industry.

The fundamental thesis of this paper was that where relevant infrastructure is readily accessible; where the factors of production include undeveloped ideas and unarticulated know-how; and where the allocation of human creativity and/or intellectual input are relied upon as the impetus of innovation, social production may be the most efficient mode of production when contrasted with alternate modes of production such as state-, firm-, or market-based production. An important corollary of this article that is implicit within the paper is that social production provides opportunity to diversify the modes of production available within future technological production processes and, in so doing, affords the possibility of harnessing the critical liberal function of separating (economic) power.